The Dental Digest.

Vol. VIII. CHICAGO, DECEMBER, 1902. No. 12.

Original Contributions.

THIRD MOLARS.

BY C. N. PEIRCE, D.D.S., PHILADELPHIA. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY 28-31, 1902.

It is well known that in all animal life there are differences, that characters themselves are inconstant, that they may or may not appear in individuals of a species, and that under such circumstances these differences are not evidences of a break in the line of descent. In one genus we may have two tubercular molars in the inferior series, while in an allied genus three such teeth may exist, or in another but one. These conditions, when recognized, excite interest and comment, but the cause is not always apparent.

The normal dentition of man is, on each side: incisors, 2; cuspid, 1; bicuspids, 2; molars, 3; yet it is not uncommon to find in the higher races individuals who have only two molars, in one or both jaws, or if three are present, the third or posterior one is evidently a degenerate in every particular. From the frequency of this occurrence the usual estimate of the third molar is that it is variable in size, structure, durability, position and time of eruption. It is the purpose of this short paper to throw some light if possible upon the variability of this tooth, and to see if any cause can be assigned for this difference in size, structure, position, etc. While the lower third molar is the most typical in its character, yet the similarity with regard to their erratic condition is such that both the upper and lower should be classed together.

In the examination of the crania of the animals supposed to be next lower than Man, such as the Gorilla, Orang and Chimpanzee, of which many papers have been written, the third molar is with slight exception as large as the first and second, and in some cases a trifle larger, having abundance of room posterior to it, or between its distal surface and the ramus, in the lower jaw, to give free and unlimited use in the function of mastication. In addition to this, the

number and size of cusps, and the number, position and size of roots or fangs, correspond in every way with the teeth just anterior to them, the cusps especially being arranged according to the typical pattern.

In the lowest races of mankind the third molar is usually of large size, well formed, of dense structure, and seldom misplaced. In the examination of crania belonging to the native-born African we are certainly in touch with the least developed of the human family, and where it is fair to assume the food is coarse and uncooked, requiring powerful muscles and dense teeth for its mastication. Of these people we had one hundred and fifty crania under examination, and in these there were four hundred third molars in position. Three hundred and seventy-five of these were as large and well shaped as the molars anterior to them, twenty-four were smaller, and one was a small peg-shaped tooth.

On the examination of fifty crania of the Eskimos we were in contact with a people of whom the name would imply lived largely on raw flesh, it being their custom to consume fish and game in this manner. Their home has been Greenland, the Aleutian islands and Alaska. In these fifty crania were found one hundred and fifty third molars in place, one hundred and thirty of full size and like the first and second, save four had wrinkled masticating surfaces, such as are found in the Orang, twenty were smaller in size, with the cusps well defined.

The Chippeway Indians were in close contact, in location to the Eskimos, occupying the Southern part of Labrador, shores of Hudson Bay, and the lakes of Michigan and Superior. From their close contact with the Eskimos they partook much of their habits of life, and especially so in their food. It is not therefore surprising that we should find in them a close resemblance to their neighbors in tooth development. On the examination of twenty crania, sixty third molars were in place, fifty-two of these were large and well formed, not inferior to the anterior molars, while eight were smaller in size, some of them being much wrinkled on the masticating surface.

The Sandwich Islanders, or natives of the Hawaiian Islands, have lived upon pork and fish, both dried and fresh, also consuming a variety of fruit growing upon the Island in great profusion. On examining sixty-five of the crania of these natives, two hundred and thirty third molars were found in place, two hundred and ten

of these were large and well formed, while twenty were smaller than the first and second molars.

From the eastern portion of Siberia we have the peninsula of Kamchatka. This country is inhabited by a strong, hardy people, capable of any amount of toil and hardships and thoroughly inured to the severities of the climate. Eighty crania were examined, these had two hundred and sixty third molars in place, two hundred and twenty of them were of full size and density, while forty were smaller in size with imperfections in shape.

The Malay Peninsula is the most southern point of Asia. The natives are in a low state of culture, living entirely by the chase, pursuing the game with poisoned arrows. Eighteen crania were all to which we had access. These had thirty third molars in place, of which twenty-five were full size compared with the first and second, while five were smaller.

Notwithstanding the large population of India and the thousands that annually die, the collection of crania accessible is very small. The diet of the natives is largely vegetable, rice forming an important staple. The twenty crania examined furnished only thirty third molars in position, fifteen of these were large, and a like number smaller than the molars anterior to them.

The crania of the Egyptians were limited to twenty-five for examination. These had only fifty third molars in place; twenty-five of these were large and twenty-five small. Their diet, like the people of India, was largely vegetable.

The natives of Sweden, like the people of India and the Egyptians, divided the large and smaller third molars equally between them, there being only eleven in place in this small number of crania, five of these were large and six small.

Of the Peruvians we had only ten crania for examination. Thirty third molars were in place, ten of these were as large as the first and second molars, while twenty were smaller. This result was not surprising, as these people lived almost exclusively on cooked vegetable diet and fruit.

In the foregoing statement regarding the condition of the third molars in ten distinct varieties of the human family the writer is well aware that the number cited is meager, but great were the surprise and disappointment to find the molar in question so frequently lost or absent from the jaw examined. The bones in the cases neces-

sarily become dry, so that individual teeth drop out, and the third molars, where the crown and roots are reduced in size, are more liable to this displacement than any of the other teeth, hence the deficiency was in the locality that produced the greatest discrepancy in the examination.

As meager as the foregoing illustrations are, they give us a slight insight into the conditions under which we should expect to find a well-developed third molar, and without assigning any cause they indicate the nationalities where degeneracy of this tooth has certainly made perceptible progress. By adding the testimony of prominent and well-known observers it will be readily seen that modern life and higher civilization have decreased to a marked degree not only the size but the structure and general characteristics of this tooth, even to its complete absence in some families and its partial disappearance in many.

Dr. A. H. Thompson says: "In the lowest races of mankind the wisdom tooth is of large size and is seldom misplaced. It grows smaller as we ascend the scale of civilization."

Charles Tomes says: "In the lower races the wisdom tooth has ample space to range with the other molars. It is a fully developed upper or lower molar and has the characteristic pattern, that is, quadricuspid if above and quinquicuspid if below, and the roots are like the corresponding molars."

Darwin says: "In civilized man the degraded condition of this tooth in its degeneracy and imperfection is very great, as compared with the nearly perfect condition of the same organ in the lower primates. Still more marked differences are found between the savage and civilized races than between the savage races and animals."

Prof. Schaaffhausen accounts for "this difference between the races by the posterior dental portion of the jaw being always shortened in those that are civilized, and this shortening may be attributed to civilized man habitually feeding on soft, cooked food, thus abridging the use of his jaws. Of seven hundred and sixty-three persons over twenty-six years of age three hundred and forty-two were males and four hundred and twenty-one were females; forty-two per cent of the males and thirty-eight per cent of the females possessed no third molars." He states further that as there is no space between the second molar and the angle of the jaw after the twenty-sixth year,

this is proof that nature has made no provision for the eruption of the third molar.

Prof. Wortman says: "In the white man the shortening of the face and consequent reduction of the facial skeleton have materially affected the dental arch. To such an extent is this true that it is almost the exception nowadays to find a perfectly well formed arch with a normal set of teeth. The teeth that have been most affected by this change are the last molars, which may be truly said to be in an advanced state of disappearance, and at no very distant period the European skull will be characterized by the absence of the third molar. When it is developed it is always smaller than the other molars, the roots are connate or grown together, and it is so lacking in vitality as to be subject to rapid decay, frequently necessitating early removal."

Dr. Daniel G. Brinton says: "In nearly all the black people the wisdom teeth are generally furnished with three fangs and are sound, while among the whites they have only two fangs and decay early. Most ancient jaws exhumed in Europe present the former character."

Richard Owen says: "The wisdom tooth is sometimes not developed."

With fifty years of professional work the writer has had several very serious experiences resulting from the impaction of the third molar. These of course have been where nature has failed to provide room for its eruption, and also where artificial assistance was not given in time by the removal of the second molar, to anticipate the impaction and the necessary inflammatory condition with its unfortunate concomitants. In addition to these experiences of sickness and suffering, where in some cases life was endangered, observation has taught that more than seventy-five per cent of these teeth have been less in size than the first and second molars. All of these have had not more than four cusps and often only three, especially those in the upper jaw, where the roots were invariably conoid and curved posteriorly. While the crowns have in the majority of cases been quadrangular in shape, frequently those have been found that were irregular and almost without form. The masticating surface of the inferior tooth has often been found wrinkled to such an extent that it would indicate a reversion to the Orang, where that character is so prevalent.

The buccal and distal surfaces of this molar are usually more con-

vex than the same surfaces of the first and second molars, while their mesial and lingual surfaces are very similar. This difference in size and conformation is not the only divergence from the teeth anterior to them. Their variability in structure, time of eruption and durability are evidences of degeneracy and of the marked tendency to ultimate elimination.

Another diversion from what may be termed the normal denture is the presence of the fourth molar, always occurring in the upper jaw. Only three times has this been observed by the writer; once where it was on either side of the mouth and twice on one side only. The additional tooth was between the second and third molar and in general appearance resembled the second molar. Of these fourth molars Dr. Thompson quotes from Mr. Mummery, who reports nine cases found on the examination of three hundred and twenty-eight West Africans. We have in the Morton Collection, Academy of Natural Sciences, Philadelphia, an Australian skull with thirty-five teeth. These subjects with additional teeth may all be considered reversions to a primitive condition.

In considering the foregoing statements, is it possible to attribute the predominance of the prognathous jaw and its correspondence with the large third molars entirely to absence of culture and the food habit, and not at the same time extend these influences to the shortened maxillary with smaller and crowded molars and the deficiency of teeth? The latter condition certainly belongs to civilized life. The pertinent inquiry which interests us all is, what are the important factors in producing the result?

With civilized life and higher education we have an exalted sensibility of the nervous system, a larger brain case, an enlarged brain. Are these factors, or is it the concomitant of these, such as cooked and less coarse food, with accompanying conditions, which entail less force in mastication, hence less muscular energy, and teeth less in density and less in size? Again, is the size, the stature of the individual, of consequence in estimating the size and structure of the teeth? While the influence of use and disuse have been considered important factors in tooth development by the writer, yet other elements have doubtless played their part in the modification of these structures, so that one needs to be guarded in making dogmatic statements. It is not possible in a few hours' study annually to solve these natural phenomena, so the best we can do is to watch and wait.

Discussion. *Dr. J. Y. Crawford,* Nashville: The main point of emphasis in this admirable paper is the influence which the withdrawal of functional activity has upon the development of tooth structure. The same laws that influence the modification of these teeth, the changing of their physical formation, and their obliteration, must be reckoned with as factors in the production of the diseases and the decay of the teeth. We forget that environment and withdrawal of functional activities not only tend to obliterate the third molar, but exert an influence upon the last of the three series of teeth in the mouth. The absence of the second bicuspid may often be traced to the same influences that worked upon the third molar.

This paper emphasizes the fact that a study of the question sustains the belief that the change of climate, mixing of races and withdrawal of proper functional activity are much more conspicuous factors in the destructive processes of the teeth than we supposed. I was once discussing a paper along this line before the Virginia State Dental Society, and after the session an old Virginia dentist remarked to me, that when the planters in slavery days came back from a trip North they would not let negroes wait upon them at table who did not have good teeth, but no matter how good their teeth might be when they were taken out of the fields and put in the house, "a regime of white folks' soft food soon made their teeth decay. Now since the war the negroes are becoming more civilized, and their teeth are decaying just like those of white folks." I replied that he should have made those remarks on the floor and saved me the trouble of a long explanation about "the withdrawal of functional activity." The teeth are tissues of the human organism and respond to all the laws which govern other tissues, although perhaps in a less marked degree. The withdrawal of functional activity not only tends to obliterate the third molar, but it makes the other teeth more susceptible to disease.

Dr. A. H. Thompson, Topeka, Kan.: It is a singular fact, as Dr. Peirce has stated, that in the lower races which are poorly developed mentally but well developed physically these teeth still maintain a considerable functional activity. This is especially true in the negro race. My attention was called to this in examining some beautiful specimens of skulls of the people of the Florida Keys, found in the shell mounds, in which the savage characteristics are greatly exaggerated, and these teeth are beautifully formed and quite as complete

as the other molars in the same series, so that they approach the ape-like form. Yet this degeneracy of third molars, as was remarked by Dr. Peirce, extends back to some of the quadrumina and is found in the Chimpanzee. In the very lowest human races, such as the Bushmen of Australia, and among prehistoric peoples, there is in all a tendency to reduction of the third molar, so we see that it begins very far back. As we advance in the scale of development and civilization these teeth are much reduced, a large number of them absent, and others impacted and productive of disease. This is true of all civilized peoples, both ancient and modern. I noticed this especially in my study of the Peruvians, who were highly civilized in their way, and among them were found as many degenerate third molars as among Europeans.

Dr. J. Taft, Ann Arbor, Mich.: I am not in sympathy with the idea that the human third molar is undergoing a process of suppression. No doubt it is somewhat impaired, but that is probably due to a lack of proper use, a want of normal activity, as a result of which the jaws and the teeth are not developed as they once were or as they would now be under different circumstances. We have all often observed that people who thoroughly masticate their food have better teeth than those who do not, and it is necessary for the proper growth and development of the teeth that they have exercise. Any organ would deteriorate if not used as nature intended. If during the development of the teeth they were used as they should be, and as other peoples have used them, they would be just as perfect to-day as they were in the earlier periods of the race. I do not believe that the teeth are necessarily undergoing a process of deterioration. It is not necessary for us to return to barbarism or to the habits of life of earlier races, as it should be a simple matter to educate our patients and their children to use their teeth as nature intended. When this is done the third molar will equal the others and the rest of the teeth will not be so subject to decay.

Dr. J. D. Patterson, Kansas City: I have been much interested in the paper and discussion, but I do not bemoan the disappearance of the third molars as some others seem to. If we could get rid of all of them it would save us an immense amount of trouble, and I wish Dr. Thompson and others would hasten their disappearance, so that impacted third molars and the conservation of erupted ones would not burden the later years of our practice as they are now doing.

Dr. James Truman, Philadelphia: Dr. Peirce has spent three years in working up the matter for this paper, and he is to be congratulated upon the result. I know the third molar has been a troublesome tooth to every practitioner, but in the earlier races it was quite a different molar from that of civilization. As peoples develop the jaw begins to recede and contract. I cannot agree with Dr. Taft's statement that this contraction is due to variations of food. These teeth are all developed in what is known as the follicular stage, and it is then that the contraction probably takes place, and as the jaw recedes backward these teeth suffer more or less compression and gradually develop smaller bodies. The idea that this development can be produced after the enamel is formed is contrary to all recognized theories of comparative anatomy and general histology. As to the third molar being lost, it may be crowded out of its proper place, but I doubt very much if it will ever be absolutely lost. This same condition of small third molars is found in civilized races thousands of years before the Christian era, and I don't think there has been any practical change in these teeth within the development of the present civilization.

Dr. Peirce, closing discussion: I commenced this examination of third molars with the belief that use and disuse modified structures, but I found it probable that other factors were at work. The fact that the third molar is better developed and more efficient in uncivilized than in civilized life is certainly strong evidence that a modification of diet has had its influence in the development of the tooth. When we find that savage people, who live largely by the chase and on raw and coarse food, have a better third molar than others higher in the scale of civilization, we cannot but infer that diet has influenced the tooth. In talking recently with a prominent scientist I asked his opinion regarding the influence of use and disuse. He replied, "I am entirely ignorant. For many years I believed that these were factors, but to-day I do not know." I must take the same stand. Statistics show that at least seventy-five per cent of the third molars of civilized people of to-day are reduced in size, and we must look for some reason. While I may still adhere to the view that use and disuse do modify structures, I am quite convinced that other factors with which we are not familiar also play an important part in the reduction of this tooth as well as of other tissues.

A BIRD'S-EYE VIEW OF PATHOLOGY.

BY D. R. STUBBLEFIELD, D.D.S., NASHVILLE, TENN. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY 28-31, 1902.

When the request for a "touch of your quality on Pathology" was first received it temporarily blinded me to the responsibility of its acceptance, but when the acceptance had burned the bridges behind me the pleasure died out and the responsibility seemed to take on new life. The conviction, however, that the whole must forever be greater than any part, though at the same time necessarily restricted to the sum of the parts, gave me the courage to hope that a contribution might fill some place without which even this annual session would not be complete. The professionally patriotic duty is upon every member to respond to the call of the sponsors for each section of this great national body and to do his best to meet the demand made upon him. Another reason for the faith that's in me is found in the statement contained in a letter received recently from the president of a state association. It is, "I select the other subject because I believe a paper on Pathology is usually one fool trying to teach a lot of other fools what he doesn't know himself and what they can never hope to understand." If such a sentiment can honestly exist in the mind of a typical member of the profession, there should be no apology necessary for any attempt to render more simple what is so fundamental to our everyday work. In articles, as in life, it is not what you do but how you do it that differentiates the man from the fellow. There is no subject so abstruse that its fundamental principles may not be stated so tersely that they can be comprehended easily. My hope is to thus simply and clearly present the essential principles of Pathology.

Pathology is the study of diseased or perverted functions, as distinguished from Physiology, which considers healthy or normal functions. This change from the healthy function is an effect, and, like all other effects, must have a cause. The ascertaining of the cause or causes constitutes the central idea in all diagnostic efforts, and their removal, followed by the restoration from structural or functional disturbances, is the object aimed at in all therapeutic endeavors. "Remove the cause" is not only the first law of Surgery, but the watchword of reformation in all realms—physical, mental and

even moral—in which we live and have our being. In the treatment of disease it is the golden text, and should be the beginning, the continuance and the end of instruction.

The *causes* of pathological conditions are very naturally divided into two classes, those from *within* and those from *without* the organism. In point of frequency, as in ease of comprehension, those from the outside are the most prominent. They are "unsanitary surroundings," "outside interferences" and all causes which are not born of and inside the organism. This of course includes all types of microorganisms, which, while proliferating within the organism, are not born of it and are foreign inhabitants therein.

The other class comprises a more obscure and oftentimes intangible source of disturbance, generally brought within the term malnutrition, or those influences that pervert the course of nature and bring deformity. This second class constitutes the special field for the enterprising theorist, the "green pastures and still waters" of the visionary etiologist, and yet remains the great terra incognita of the medical philosopher and scientist of the present and future. With all that modern extension of observation into the very *ultima Thule* of cell-life has attained, and with all the focalization of interested human agency in the possession of this key to the situation, the best conclusions regarding the nature of this class of causes are but gropings in the dark. Intangible causes of perverted nutrition, acting in the obscure land of material formative possibility, have as yet evaded the keenest, most interested scrutiny of modern, Argus-eyed science. We know the results, the effects, but must still *speculate* as to the *what,* the *how,* and even the *wherefore.* In this field it is possible that he knows the most whose imagination rises upon tireless pinions and whose scientific gaze does not blink in the face of the sun.

In the second class we know more. "Unsanitary surroundings," as a cause of pathological conditions, are not absolutely defined. Broadly stated, we think we know what is meant by surroundings that produce disease, but when we see that what is one man's poison is the other man's meat, our certainty grows less certain. Nevertheless, we accept such when generally stated as one of the understood causes of pathological conditions. "Outside interferences" are plainer still. We can readily accept this class and are not doubtful in placing it as certain causes easily understood. Lesions,

wounds of all kinds, poisons—local and general, these and their thousand and one modifications are accepted and known by all men. With equal certainty, and yet with less definiteness of limitation, do we also accept and understand microorganisms as causes of pathological conditions. It is not necessary here to attempt any classification, however brief, but it will be sufficient to say that some microorganisms are disease-producing and others are not. We shall not attempt to separate these two general classes, for our purpose is to indicate, not exhaust, and we feel we can rest secure upon the above general statement in the presence of such a body as this.

But what are these microorganisms? We know, though the world at large does not, that they are members of the vegetable kingdom just as definitely as are trees, flowers, cereals and all those forms of plant life with which the world is familiar. The fact that they are microscopically small, and uncountably numerous, and marvelously capable of reproduction, and constantly present in air and earth and all organic tissue, has given to them the suggestion of mysterious powers of activity far beyond the appreciation of the ordinary mind. It comes almost in the nature of a shock to declare that they are dependent upon their environing conditions, and are as much limited in growth and development by the presence or absence of favorable surroundings as the fragrant pets of the greenhouse or the wholesome friends of the kitchen-garden. No one wondered when it was found that the wheat in the dark, dry, cool chambers of the Pyramid had failed to germinate, and only a few marveled when heat, light, moisture and earthly food caused the latent powers of development to produce the blade, the stalk and the ear, but when this clear process is applied to those minute plants called germs the analogy passes into the incomprehensible. The attending mysteries of only microscopical observation, and only laboratory study, and the general, awe-inspiring responsibility of being the cause of the ills that flesh is heir to, have confused the minds of the masses and they refuse to accept such a simple and everyday analogy.

It is not hard to believe that heat and moisture and food of a proper kind are essential to organic life, but the mind seems to "go up into the air" when asked to apply such familiar necessities to viewless creatures invested with powers so potent when in action. We accept the statements with equal minds from the biologist and agricultural chemist that animals and plants alike depend upon the

supply of food and the favorable circumstances otherwise, but we shake our heads with ill-concealed doubting when such common sense is applied to microbes. We recognize the necessity of organic disintegration and ultimate solution of the food products for the sustenance of our own bodies, and yet we wonder why fermentation is an essential to the well-being of microscopic organic life. With this analogical key we may unlock many mysteries. Sanitation, state medicine, may be summarized as an effort to produce a famine in the land of the micro-entities. Health-seeking in dry altitudes is the encouragement of High License among the Bacilli, thereby limiting their power. Germicides, antiseptics and disinfectants are only the minions of Pharoah Scientificus seeking the death of the first born from the palace to the hovel.

Said the microbe to the germlet as they paused to get their breath,
In the giddy dance of being—proliferation—death,
"Have you heard the latest mandate that high Jove's put on the rig,
Since he's quit the lightning business and is resting on his dig?
Well, I'll tell you, it's a corker, just the thing we mites have needed
Since the earth and all its fullness to our special use was deeded—
'Change shall be the law unchanging from Creation's dawn to end,
Shown in ceaseless recreation from the wholes that ferments rend.'"

Now, then, we have seen that Pathology deals with perverted Physiology, and that every taking care of sick folks or sick things in our lives was being occupied in that realm. It is no unknowable world, although it may be unknown, and it is just as familiar in varying degree as the thousand and one ailments of life with which all must deal. We have seen that the causes of these pathological conditions when reduced to the simplest analysis are from two sources, outside and inside the organism. Looking a little further, we have seen that outside interferences and surroundings, lesions of all kinds, and microorganisms, which, while they inhabit are foreign to the human organism, constitute the causes outside; and that malnutrition or interferences of a less tangible form with the course of tissue-building and tissue-waste in the physiological activities of the organs make up the inside causes. We have seen that "unsanitary surroundings" are such a variable cause of pathological changes that while they are commonly accepted as an easily understood cause, they really afford grounds for much more discussion and investigation before the truth will be certainly known. Lesions, chemical

and traumatic, appeal so directly to the senses that we feel they are understood. Microorganisms, or those organized ferments from a vegetable source that cause pathological changes by the liberation of by-products, are not so well understood, but still are less of a mystery than a few years ago.

These are the causes that produce the effect called disease. The simplest possible paraphrasing of that effect is Inflammation. All those causes produce a series of structural changes called inflammation, which exhibits a protean multiplicity of variation because the simple process is modified by the structure, or environment, or the degree of resistance of the *vis medicatrix naturæ*. If we get a clear grasp upon the simplest form of inflammation, understand its nature from inception to termination, and hold this definitely before our mind's eye, we can see the simple analogy growing more complex by easy stages that do not befuddle the mind. It is not always an easy thing to ascertain the cause, for irritation, shock, the vague and reflex beyond the ken of the most astute, give cause to a series of effects far out of proportion, as far as we may judge. Indeed, there is something quite uncanny in seeing living tissue pervaded all the time—we must admit—by the possible causes of pathological conditions; and yet, day after day, even year after year, it is not upset by their presence, until all of a sudden the power to resist is lost and disease sets in just because there has been some modification of our Heaven-given tendency to get well and stay so. In the twinkling of an eye the kiss of a zephyr has lowered the resistance of our system, and the tell-tale sneeze announces the first, inconsequential step in a series that may end in death. The little "taking cold" is nothing, but if it is assisted by a still greater disturbance of the system's equipoise, coincidental merely, with its more pronounced lowering of vitality or lessening of the resistance to morbific influences, it may bring the organism within the baleful reach of the tubercle bacillus, which has up to then been vainly seeking food for his development.

In just such a vague and unexpected manner do we find inflammation of a most serious nature breaking the bonds that have been holding it in abeyance. It must be so, since no epidemic was ever universal, some individuals managing always to keep the immunity of molecular resistance to possible causes of disease present in their bodies. Inflammation in the early stage is nature's great rally to

expel an intruder. No man knows of how many victorius repulses, or how many hairbreadth escapes possibly, he has been the ignorant and unappreciative recipient. Nature's sentinels have been on guard and her hosts have slept on their arms ever since we came squalling onto the battle-ground of life, and until life's fitful fever is over we may confidently rely upon that great recuperative power implanted within us and within all living organisms, whether vegetable or animal. If inflammation in the early stage is the rally of nature, the symptoms which always attend it are the signs of the losing fight which she is waging, that may be in part a defeat yet on the whole a victory, and we may always tell the stage of the series by reading the signs of symptoms.

The blood is the great first relief to the wounded upon which nature relies. Too much blood is an embarrassment of riches, and congestions become extensions of the trouble which they were created to relieve. Should nature be able to stem the tide of affairs, to remove the cause and hurry on the current of blood that has already begun to show a tendency to lag, and pass it on through the proper channels and into the far reaches of the capillary ramifications, then we have resolution, a resumption of function, and a reestablishment of Physiology. If, on the other hand, nature finds herself unable to cope with the persistent results of irritation, and the accumulation of well-meant blood, she gets to work to limit and circumscribe the effects. A wall is built up around the area and the fight to keep destruction inside the smallest possible space is begun.

This is nature's plan, and all efforts to cooperate should be exhibited with a clear comprehension of the end aimed at and the reparative efforts put forth. The terminations of inflammation are only the best compromises she can make under the circumstances. We may intelligently assist or we may blindly antagonize should our interferences be made without judgment. But why make the story longer? The mind can readily grasp the scheme entire and see the steps to be taken for cooperation, see the possible antagonisms which might arise to thwart, and see the ends aimed at from a judicious interpretation of all the signs and signals. The wonderful diversity of nature in form and feature gives us the unquestioned probability of myriad modifications. Therefore, the question of treatment must forever remain the burden of the hour, for a host of possibilities spring up at the very mention of pathological derangement. No

man can ever hope to lift this burden from the shoulders of the man, and if any man can bear into the quiet chamber of his own soul the consciousness of having done his best at all times he should deem himself the most fortunate of mankind.

Discussion. *Dr. W. C. Barrett,* Buffalo: I can remember the time in the history of this Association when the presentation of a paper on pure pathology would have found but few to debate it, and when the treatment of a subject from a pathological standpoint would have emptied the house in a few moments. Nowadays, however, pathology receives more attention from this body than any other one subject, which is a marked advance.

This paper considers the change from the physiological—the normal, to the pathological—the abnormal, and as the essayist has stated, there are three methods by which this may be brought about: First, by unsanitary surroundings; second, by perverted or malnutrition, and third, by external influences. I am glad that he has given us such a broad basis upon which the subject can be considered, because all side issues are eliminated, and the thought is concentrated upon three distinct points. This is an excellent classification.

Dr. James Truman, Philadelphia: This paper is one of the ablest definitions of pathological conditions that I have heard for a long time. Thirty years ago I remember remarking to a distinguished medical colleague that the time would come when bacteria would be regarded as the source of all pathological conditions. He almost laughed in my face as he said: "They will probably be confined to three or four pathological conditions." Every one of us is well aware that to-day the majority of diseases are attributed to these minute vegetable products, and it is to them that we as dentists and pathologists must devote special attention. I am gratified that bacteriology has become an important study in all our dental colleges, and that the students of to-day are prepared to treat cases and to give an intelligent answer when asked concerning the cause of certain pathological conditions. It is the mission of dentistry to cultivate the minds, not only of this profession and of the medical profession, but of the great laity, so as to enable them to understand that it is unsanitary conditions of life which produce these pathological organisms. I would emphasize the necessity of prophylactic treatment, as I am thoroughly convinced that the bacilli of tuberculosis, being ever present in the oral cavity, are a constant source of disease

and destruction to the human family. It is the duty of the profession to instruct the world concerning prophylaxis of the oral cavity, so that all forms of contamination therein may be removed and not be left to breed disease throughout the system.

Dr. Fillebrown remarked in his report that Miller did not find the gelatinous plaques of Williams a cause of decay. They are certainly not a cause of decay, although Williams has made that positive assertion. Nevertheless, there are certain accretions in the mouth of every individual that cannot be cleaned off, and given the opportunity, tuberculosis will certainly find a place therein for development. Can we not teach in our public schools and go forth as missionaries in regard to this matter, to make the world at large understand that dentistry is something more than the mere filling and extraction of teeth? We should be the leaders in all attempts to improve the condition of humanity.

FIRST PERMANENT MOLAR.

BY J. N. CROUSE, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I have been induced to make a plea for a more general preservation of this most important tooth. In this paper I may not express any new thought, or tell this intelligent body anything now unknown on the subject, but I wish rather to incite more earnestness, so that the forceps may be less frequently used, and this organ be more often saved.

I am sure that every practitioner of any considerable experience will agree with me that much too great a percentage of our patients have their masticatory apparatuses deformed and lessened in their usefulness by the loss of these teeth. In many cases the entire occlusal surfaces are changed, and an abnormal position of the teeth has resulted from the early extraction of one or more of the first permanent molars. If the occlusion is not impaired, then there are spaces made that should be occupied by these teeth.

Owing to the fact that these teeth are the first of the permanent set to be erupted, and that at an early age their preservation is many times not thought important by the guardians of the child, they being under the impression that they belong to the deciduous set, therefore, even when it is known that caries is taking place, the

child is not taken to the dentist until perhaps too late to save the organs.

This mistake of not having the child's teeth examined at the proper time is not always the fault of the parents. It surely is a part of the family dentist's duty to keep those in his care informed on all matters which have in view a perfect denture at maturity. In other words, the dentist has other important responsibilities besides repairing the ravages of decay. If he entirely fulfills his mission it will go far beyond simply carrying out the usual program of an office practice. He should be an educator in his special calling in the community in which he lives, and should impart his knowledge earnestly and in a way that will make an impression on his clientele. A mother receiving such information will often transmit it to her relatives or friends who have young children, and so his sphere of usefulness is enlarged. All this is by the way, yet is at the same time a part of the dentist's arduous duties, which is important not only in connection with the care of the first permanent molars, but the thoroughness with which it is done will indicate the success or failure of his whole practice. If he lacks the enthusiasm and ability to get his patients to carry out these instructions, then his other important duties will lack that element which is essential to a successful practice.

The child should be brought to the dentist as soon as the tooth is erupted, which is normally between the sixth and seventh years, although I have cases in mind which were much earlier. In one instance the child when brought to me at the age of five had all first permanent molars in place and all more or less decayed. In this case a most careful parent was misled by my statement that these teeth were erupted between the sixth and seventh years, and the destructive process had therefore gone on some time, until, alarmed by the sensitiveness of the teeth, the mother brought the child to me. Nevertheless, that child, now a woman with a family of children, has all the teeth in her mouth and in a good state of preservation.

The dentist should insist upon seeing the children in his care often and early, with a view of examining the mouth, especially the first permanent molars, as soon as erupted. In fact, in many cases these important organs should have attention before they are fully erupted. A careful examination will often show defects of

more or less magnitude, particularly in the fissures in the grinding surfaces, they having failed to close up completely in their formation, food lodging in them and caries beginning at an early age. They should be cleaned out, generally with an excavator, and softened portions of the tooth removed, and then be filled with cement.

This treatment in my hands has not been followed with uniformly good results, fillings in the same mouths at one time proving very durable and at another time only temporary. The failures, I am sure now, were due to the faultiness of the cement, which in one case caused the loss of the pulp and in several others extensive decay under the cement, yet some of these fillings outwardly looked perfect. These failures caused me to abandon its use for this purpose. Had I known then what I know now I could have averted these mishaps by testing the cement and making sure whether or not it was fit to use. Now I always use cement in these permanent molars where they need early care, which, when properly used, makes a very durable filling, and will tide over the time until the child is older and can have permanent fillings made, which at an early age would not be wise to attempt.

Should this important organ ever be extracted? If so, under what conditions? In two instances I have removed the four permanent molars as soon as erupted, because they were almost devoid of enamel and so poorly developed that it seemed the proper thing to do; whereas, with our advanced system of crowning, they could have been saved. I delayed my decision, however, until I could see the ends of the permanent incisors, which showed but little of the effect of the faulty nutrition which existed when the molars were forming, and the balance of the teeth were well developed. In both cases the second molars took about the same position that would have been occupied by the first had they been allowed to remain, the third molars taking the place of the second, yet the occlusion was very faulty in both mouths. I mean by that that the teeth were not in position to prepare the food for the stomach as well as they would have been had the first molars been kept in place. Besides that, the shape of the mouths was marred to a certain extent. In two or three other instances I have removed the first superior permanent molars to lessen the deformity of the mouth from over-bite, which was hereditary, and I believe the

patients were benefitted by such treatment. It must be borne in mind that the first permanent molar is the tooth that influences the position of all the other teeth, not only until they have erupted, but until they have taken their position and proper occlusion has been started in the mouth. For this reason I make my plea for its preservation, even in extreme cases.

Barring the conditions mentioned, I can hardly conceive of any other wherein I would feel justified in removing the first molars when they were fully erupted, that is, if the roots had attained full growth, or nearly full growth, before the pulp had to be removed on account of exposure or death. There was at one time a number of practitioners, small indeed, who advocated the removal of the first permanent molars as a universal practice. Of late I have not heard much of these extremists, and they have probably all departed to a land where they now know better, or abandoned their folly. There is another class of able practitioners who advocate the removal of the first permanent molars when the necessity for the removal of the pulp occurs at an early age, say before the twelfth year, even though the tooth has been fully erupted. If I understand their teaching, it is that under the age mentioned the roots of such a tooth could not be filled and the tooth be made comfortable. It is with this class that I must differ, and my belief comes from the best source possible—actual practice and experience in the mouth.

I do not now call to mind the removal of the first permanent molar from the mouth of any child I have had charge of, except as already described, and I have taken care of a number of teeth where the pulp was lost one or two years after the tooth was fully erupted, and even some extreme cases where the root had not gotten its full growth, yet such teeth were made comfortable and durable. I am aware that at this early age the apical foramen of the root is large, and the filling of the root requires exceeding care, and I take the position that the chances of success are lessened when attempt is made to fill such roots with gutta-percha, as I believe is the general practice. I have always used oxychlorid of zinc for the filling of roots, and have had difficulty only when it had deteriorated, as the oxychlorids we have been using will do, so that solidification did not take place.

Discussion. *Dr. J. W. Cormany,* Mt. Carroll: This paper is

right along my way of thought and practice, but I would ask Dr. Crouse what we can do with a child, say seven years old, who has an exposed pulp in a first molar, and the tooth is aching badly?

Dr. G. V. Black, Chicago: The management of first molars is one of the most important subjects we can discuss in this meeting, as I regard these teeth as the most important in the mouth. They have the greatest influence in the formation of the features and in the proper development of the bones, muscles and expression of the face. The most important step that can be taken in the saving of this tooth is to impress upon the families in our hands the necessity of caring for it and not allowing it to decay. If we can emphasize to the parents the great danger in which this tooth is we will probably have the opportunity of handling it when we can do so to advantage. But when the tooth is presented to us as Dr. Cormany indicates we are helpless indeed. Almost every day in our college clinic I am compelled out of compassion for children to recommend extraction of these teeth, because it seems the best thing to do. I have observed pretty closely the efforts to save these teeth by removal of the pulp, or treatment of an abscess and filling of the roots, and while there was apparent success in many cases, the teeth have been lost later when it did more harm than its early removal would have done. If the tooth must be lost it should be lost early, as a better condition of the mouth is obtained than if the tooth is lost later. Remember, however, that we never get a perfect mouth when this tooth is lost. I recall some cases where the treatment of the pulp resulted very favorably, and some where I cut away the bulb of the pulp, saving it alive in the canals, and the root was apparently perfectly completed. However, I have not seen a degree of success in such treatment that warrants me at all in recommending it, as the failures are too general. In those years when we nearly all believed so strongly in capping pulps we did seem to save a greater number than we can nowadays. There is a condition in which capping of pulps should be undertaken, and I don't always abandon the first molar because the pulp is exposed, for these pulps will bear more mutilation and recover more rapidly than those in the teeth of adults, so it is worth while to make the effort, as wisely as our experience and judgment will allow. Nevertheless, I would not make a prolonged effort and have the child returning again and again with a severe toothache. Under such conditions the tooth

would better be extracted. My observation in removing the pulps of these teeth earlier than the twelfth year is against the operation. There is more to fear than alveolar abscess, for though that may be avoided, there is a deterioration of the matrix of the dentin that goes on slowly, so that in afterlife the teeth are not strong and will break down despite our best efforts. Furthermore, my experience has been that by far the largest number do abscess after a time. The canal and apical foramen are too large and there is too much tissue exposed to the filling material. In some cases cementum may be laid down, but it will not occur often enough to justify the procedure. The method of treatment that Dr. Crouse has outlined—filling these teeth with cement and covering with a gold cap—is most excellent, as they will be protected and preserved until they can be filled, if necessary, or until the child is old enough to have sufficient self-control to enable us to operate properly.

Dr. Crouse spoke of decay recurring under fillings, but our experience, knowledge and clinical observation are against it. It is safer to say that there was an error of observation than that this thing has occurred.

Dr. C. B. Rohland, Alton: I should like to ask Dr. Black what he would do with a boy twelve years old whose mouth presents the following conditions: Second molars just beginning to arrive; one of the first molars abscessed and the crown entirely broken away; two others with exposed pulps and crowns broken away so that filling would be impossible; the pulp not exposed in the fourth one, and while the tooth is badly broken down it could probably be filled. In other words, the four first molars, including the one with pulp intact, are so badly decayed that there seems to be no show of saving them.

Dr. Black: Take out the whole lot.

Dr. G. H. Henderson, Springfield: It is undoubtedly true that the first permanent molar is the keystone of the arch and the all-important tooth, and while Dr. Crouse has told us that the patients under our care must be watched, what are we to do when nine out of ten children hardly know what a dentist is, and when perhaps their parents have never been in a dental office. The trouble is that we don't do half enough to educate the public as to the importance of the first permanent molars. Whenever I have a school-teacher in the chair I am glad to spend considerable time educating her, but

teachers don't get to the children early enough. Important facts concerning the teeth should be in the school text-books. The present school physiologies are wofully deficient in this regard. Many parents would not wittingly allow a single one of their children's teeth to be lost, but they don't know the importance of early dental inspection, so the harm is done before we are called upon. These important facts ought to be given to the people of the land.

Dr. J. H. Woolley, Chicago: Last fall the Northern Illinois Society had a paper on children's teeth, and some action was taken with regard to publishing a little pamphlet for mothers giving instruction about the teeth.

Dr. Cormany: I am chairman of the committee that was appointed. The expense of the book was to be paid out of the treasury, and each member was to receive a certain number free of charge. However, we learned that the National Association was getting out a pamphlet of the same kind, so waited to see what it would be. If it does not appear soon we will proceed indepedently.

Dr. Edmund Noyes, Chicago: Twice in the past this society appointed a committee to prepare such a pamphlet. The first was written by Dr. Judd, but the demand was very small, and the members took so little interest in the work as to make it discouraging. Some years later I was appointed to the same office, but although I spent much time and effort in making the pamphlet suitable for its purpose, the matter had so little popularity and success as to daunt the most enthusiastic.

Dr. Crouse, closing discussion: I was induced to write this paper by hearing in other meetings just such remarks as have been offered here. I do not like to differ with such an authority as Dr. Black, but my experience has been so different from his that I am compelled to. I have to-day in my own mouth two first molars, one of which abscessed when I was nine years old and the other a year later, but they are now comfortable and serviceable. There must be some cause for the difference between my experience and that of others, as I have not exaggerated my success. If a dentist extracted first molars for a child of mine I would sue him for damages, as the harm to the mouth in taking out those four teeth is much greater than in leaving them in position, even though they are not so serviceable as those with live pulps. I have more faith than Dr. Black in pulpless teeth. I never destroy the pulp if it can be avoided, but I

could not bring myself to extract the first permanent molars merely because the pulps were dead—at any rate not until I had given them a fair trial. Somebody is mistaken, and it would require more proof than has been submitted here to convince me that it is I, for my clinical experience is about as long and good as the next man's. In reply to Dr. Cormany, I would keep the tooth from aching if possible, but if it persisted I would fill the root and keep the tooth in position as long as possible.

OPERATIVE DENTISTRY—INCIDENTS OF OFFICE PRACTICE.

BY C. N. JOHNSON, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

First I would report a disastrous failure which may be more instructive than a success would be. A lady came to me with a very badly discolored central incisor, and stated that at one time it had been bleached successfully, had remained so temporarily, and then had discolored worse than ever. The tooth had been opened from the lingual surface and I removed the filling. Twenty-five per cent pyrozone was applied with apparent success, but in forty-eight hours the discoloration was as bad as ever. I then sealed pyrozone in the cavity for twenty-four hours; the tooth bleached out perfectly, but again became discolored. Next I used sodium dioxid in the ordinary way, bleaching the tooth successfully while the patient was in the chair, but in twenty-four hours it was as black as ever. Then I was ready to give up, but the patient insisted that the tooth must be bleached, so in desperation I sealed a small quantity of sodium dioxid in the tooth and instructed patient to return in twenty-four hours. She did not come back for three days, and then I found a considerable amount of gum tissue over the labial portion of the root entirely eaten away, so that when I picked it off the root there was exposed for four or five millimeters from the normal gingival margin. I then found that in the previous opening through the lingual surface the drill had gone through the tooth and opened the side of the root on the labial surface. In removing the filling I did not get it all out clear to that point. The pyrozone did not irritate the tissue at all, but the sodium dioxid found a slight opening and ate the gum away. I

then discovered that there was some gutta-percha where the attempt had been made to fill the artificial opening. Here was a problem, as the tooth was ruined, and the gum tissue could never be brought down over the root to its normal form. After a good deal of explanation on my part, to hide the mistake which the previous dentist had made in drilling through the root, I constructed a porcelain crown, using gum enamel to fill in the place where the gum had been eaten away, and succeeded in making quite a presentable tooth out of it.

Recently a physician sent a patient to me with the statement that there was serious antral trouble and that it was necessary for me to extract the tooth. I examined the case and found an upper bicuspid abscessed, but upon inquiry of the patient could trace no trouble whatever to the antrum. The buccal root of the first bicuspid showed perfectly in the opening. The patient was much disturbed at the physician's report, so I quieted her fears, and packed some gauze and cotton in the opening, so that I might see the root more clearly. At the next sitting I cut off the end of the root with a drill. The tooth had a beautiful gold filling in it which seemed perfect, and when the patient told me who had inserted it I knew the operator had done the best he could. After cutting off the end of the root and reaming out the opening in the bone I found that the apical end of the root had not been perfectly filled. I did not want to remove the gold filling, so I cleaned out the canal from the apical end as well as I could down to the point where the gutta-percha was, and built up on it to the apex. The tissue healed beautifully over the filling and root, and there was an absolute cure without disturbing the antrum.

In the next case I did something which is usually condemned, but here it seemed advisable. A gentleman came to me with fillings in the mesio-occlusal surface of the upper third molar and the disto-occlusal surface of the second molar. The second molar extended far beyond the occlusal surface of the third molar because of the loss of some teeth in the lower jaw. The lower third molar struck against the occlusal surface of the upper third molar and slightly against the distal surface of the second molar. To fill these cavities and have them separate always resulted in the packing of food in there and the dislodgment of the fillings. The fillings failed before the patient came to me, and they failed in my hands, so I could see no way out of the difficulty unless the interproximal space could be bridged. I

therefore filled the two cavities, bridging across from the second to the third molar solidly with amalgam. I then polished the filling and told the patient that it would probably be a failure, for we all know that if we build fillings together in that way under ordinary circumstances one will be loosened. In this case, however, the occlusion was such that neither of the fillings became loose, and the operation is still a success after five years' trial.

I would now refer to two or three typical cases pertaining particularly to the management of our patients. A girl sixteen years old was brought to me by her aunt, with the remark that her teeth had been neglected simply because she was so afraid of a dentist. I found about twenty-five cavities, but the patient was so nervous that it was only under compulsion she came to my office at all. If ever a case required heroic and thorough treatment that one did, but if I had operated heroically I would have discouraged the patient at the first sitting. In looking over the mouth I found one or two large amalgam fillings, and it was the insertion of these that had given the patient such a dread of dentistry. I treated her very gently and disarmed her suspicions as far as possible. I did the best I could with cement and gutta-percha, and treated the patient much more than I did the teeth. Finally they were all filled and the aunt reported that the child would never again dread a dental office. When the proper time comes, and the patient has more stamina than she now possesses, I shall put permanent fillings in those teeth, and I expect to be able to save them.

The next case was a boy. I can get along pretty well with the girls, but when it comes to the boys—. This boy wasn't nervous, but he was unmanageable, and if the chair had been without arms he would have wriggled all over the room as well as all over the chair. He admitted that the work did not hurt very much, but he continued to be intractable. First I was tempted to read him the riot act and dismiss him, but on second thought I determined to get him under control. After he had had a few sittings, and I was getting on nicely with the work, he confided to me that up to this time he had always gotten out of having dentistry done by yelling and cutting up, and that several dentists had refused to work for him. After he found that such tactics would not daunt me he gave up and became a very fair patient. I think that breaking in the colts and making good patients out of them is one of the most beneficial things we can do

for dentistry and for ourselves, as it inculcates self-control as well as control over the patients.

Recently a very nice woman was driven into my office by the force of necessity. Severe operations in the past had given her such a dread of dentistry that she came to me only because her husband insisted upon it. After much persuasion I got her into the chair, and first of all cleaned her teeth. I complimented her on not being nervous about it, and she replied that what was worrying her was a loose molar which she knew must come out, but she could not stand it without an anesthetic, and her physician had forbidden that. I instantly determined to extract that tooth before she left the chair, so after much argument she allowed me to apply a "local anesthetic" (which was a little water applied with cotton to the gum), and in spite of her constant protests I finally by sheer force of persistence lifted the tooth out with my thumb and finger. The preliminary work took an hour and a half, but it was the best time I ever expended, as I entirely removed her dread of dental operations. The moral I wish to draw is this, that our chief duty to patients is not so much to make perfect fillings, although they are of course of great importance, but to study the people and obtain such control over them that they will lose their dread of the chair. There is no tooth that cannot be filled with tolerable comfort to the patient if the dentist will study the individual, yet hundreds of teeth are lost because their owners will not have them filled on account of the pain.

Discussion. *Dr. J. W. Cormany,* Mt. Carroll: I wish to ask Dr. Johnson a few questions. Suppose in the destruction of the pulp some of the paste gets out into the interproximal space and raises a disturbance, leaving a very severe condition of inflammation and a badly aching tooth; what would you do?

Dr. Johnson: I should treat it with a soothing antiseptic, see that the parts were kept absolutely clean, watch the case carefully so as to be able to remove any loose bone the moment it appeared, and keep the wound in a thoroughly aseptic condition until it healed.

Dr. Cormany: Suppose we have a good gold filling except on one side. Perhaps the margin of the cavity was not prepared just right and there is a little decayed spot in the gingival space. The filling is on the bucco-mesial surface of the first molar, and the cavity is between the enamel and gold; what would you do?

Dr. Johnson: That is a proximo-occlusal filling. If it were per-

fect in every other respect I would get rid of the gum by packing gutta-percha until perfect access was secured, and unless the failure had gone too far between the teeth I should repair the filling, employing tin and gold, amalgam, or gutta-percha, as the case might be.

Dr. Cormany: Suppose you put on a Richmond crown, and in articulating you grind a little hole through it; what do you do?

Dr. Johnson: I have never found it necessary to grind a hole through a crown in order to obtain correct occlusion, but if I should be so unfortunate I would reinvest the crown and cover the hole with solder.

Dr. Cormany: Suppose you have applied arsenic to devitalize a pulp, and upon opening up the pulp chamber you find the pulp still sensitive, and it remains in that condition for a week or a month; what would you do?

Dr. Johnson: I should look pretty hard for pulp stones, and would generally find them.

Dr. Cormany: I have lately found that a combination of one-eighth of a grain of cocain and one drop of carbolic acid applied to that pulp will enable me to remove it in five minutes without a particle of pain. After you have extracted a pulp and have dried out the cavity thoroughly, you begin to introduce your gutta-percha and hemorrhage sets in; what would you do?

Dr. Johnson: I should pack the canal with adrenalin chlorid, which is one of the best agents for stopping hemorrhage at any point that I have ever used.

Dr. C. J. Sowle, Rockford: I wonder if we ever stop to think why people come to us in fear and trembling. It is a peculiar fact that patients will exaggerate everything done in the dental chair, and they always take particular pains to make these rash statements at home before the children, so of course the little ones are frightened at the very mention of a dentist. We ought to overcome this, and tell our patients not to exaggerate these things before their children. I have a fault to find with the country dentist, namely, that when farmers' children come to him, and he knows their parents will not pay for permanent work, instead of gaining the children's confidence before extracting a tooth, he rushes for his forceps and yanks the offending member out, scaring the children quite as much as they are hurt.

Dr. M. R. Harned, Rockford: My rule with children is never to hurt them at the first sitting, but to spend all the time if necessary in

examination of the mouth and dispelling their fears. Recently a woman came twenty miles with her little girl, who had a very small cavity in a first molar. I spent an hour in coaxing, entertaining and shaming her, in all of which the mother assisted me, but I was unable to do anything with the child, so I sent her out of the room and attended to some other patients. After awhile she again got in the chair and the same performance started. I saw that she was not frightened at all, but was simply stubborn, so I said, "I shall be very glad to fix your teeth while your mother is here, and if you will behave it won't hurt you at all, but I am going to fix your teeth, and if you don't behave I shall lock your mother out of the room, and the more you struggle the more it will hurt." She would not give up, so I forced the bur into the cavity, drilled it out, and handled her rather roughly. While so doing I discovered another cavity, and when I began to work on it the child acted as nicely as possible, with the result that she was hurt hardly at all. This was a case where force was justifiable, but I believe thoroughly in managing children in some other way if possible.

Dr. S. F. Duncan, Joliet: One of the most unfortunate things that can happen to the dentist is to have the mother come with the child, and I make it a rule to have the mother stay away or at least not remain in the office. A healthy eight-year-old was absolutely unmanageable through two sittings while his mother was in the room. The third time I sent her away and the child was meek as a lamb. Children always know how to work on their parents' sympathy, and will act up in their presence as they would be ashamed to do if they were with the dentist alone.

Dr. Edmund Noyes, Chicago: At least half the fathers and mothers of our patients have average good sense, and at least fifty per cent of the mothers who come to me with their children are more help than hindrance in the office.

Dr. G. D. Sitherwood, Bloomington: It all depends on how much influence the parents have over the child. In some cases it is absolutely necessary that the mother sits beside the chair, and if the child then behaves it is of course the proper thing to do. We should not treat children as children, but as adults, with the same respect, kindness and care, for they have feelings and sensibilities, and they know what is said to them quite as well as though they were older. I have more difficulty with grown people than with children, for after

a child is once started right it remains so, which is not the case with adults. I believe in oxyphosphate for children's teeth, using gold or amalgam later and at the proper time.

Dr. F. H. Skinner, Chicago: I would relate an operation on an infant fourteen months old. The right central incisor was abscessed, the lip was swollen out even with his nose, and the four superior incisors were decayed nearly to the gum line. At the suggestion of Dr. A. H. Peck, the family physician administered ether and I lanced the abscess. The pulp canal and abscess were well washed out with water, hydrogen perodid, and Black's "1, 2, 3" was run through. I also took the pulps out of the other central and the two laterals. The canals were so large that cones were made from S. S. White's seal dressing to fill the roots, and the crowns were built up with "Fellowship" alloy. Two hours after the operation the child was eating, and for two years since he has had no trouble.

Dr. C. P. Pruyn, Chicago: About three years ago a man presented for treatment, and a left upper second molar had all the appearance of pyorrhea. I removed the deposits and treated the tooth carefully and for a long time, but there was a continual discharge, so I finally extracted it. Then the jaw would not heal, and it proved to be a case of tuberculosis, assuming a carious form. During the past two years I have operated surgically three times, and have used chlorid of zinc, sulphuric acid and the whole list of remedies indicated. For the last three months the patient has been treated with tuberculin, and it looks now as though I might be able to cure the discharge. This is not a case of marked tuberculosis, although the patient was told six years ago that he had the disease. When he presented his mouth did not show anything abnormal, except that the gum would not heal, and later the bone would not heal.

PROSTHETIC DENTISTRY—INCIDENTS OF OFFICE PRACTICE.

BY C. P. PRUYN, D.D.S. CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

When Dr. Cormany wrote that he had put me on to open this discussion I replied that it would be better for someone who was teaching the subject to take the leading part. He wrote back that he didn't want those men to open it, because they were such great talkers that

when once started they would not know when to stop. I presume this was a hint that I should say as little as possible.

I am very glad that the subject of prosthesis is receiving so much attention from the profession to-day. Only a few years ago it was relegated to a dark laboratory and little nice work was done, but now the pendulum has swung the other way. While we were greatly pleased with the advent of what seemed at the time a great blessing—vulcanite rubber—we must admit that it has been a detriment to the practice of dentistry, and the time has now come when we must seek something better. While rubber has the advantages of cheapness and rapidity of manipulation, we all admit that under rubber plates the tissue shrinks away and the features are distorted. I believe that in the near future someone will discover a cheap metal plate to take the place of rubber. Watts' and Weston's metals should be used oftener for full upper dentures. Cast aluminum has proven a comparative failure, but swaged aluminum is doing nicely, although it does not thoroughly satisfy the needs of the case. Dr. J. B. Palmer has shown me a method of making models for swaging plates which is of especial value in those cases of great overhanging of the gum, where it is difficult to make a cast and have it draw. The method is to take an impression, prepare it, get the cast, pour upon it plaster and asbestos, half and half, and when that has set remove the plaster cast. If you have a case where there is considerable overhanging, and where in the removal of the plaster cast you might perhaps break the outer rim of the plaster and asbestos impression, you can easily put those parts together again. The mould is then thoroughly dried, and into it you cast the metal. In a few instances for partial upper metal plates I have used clasp metal instead of gold. It is a little more difficult to swage, but it makes a very rigid, light, thin plate, and one that when once swaged to place will stay there indefinitely.

Clasps for cuspids. The cuspid is a very hard tooth to clasp, but a few years ago I accidentally stumbled onto a good plan. Instead of clasping the cuspid from behind forward it is clasped from within outward. In this way you reach either side of the tooth, the mesial and distal, which is especially valuable in lower cases.

If we would make more removable bridges, even though they were constructed of rubber with clasps, instead of so many fixed bridges, we would do our patients a great service. I think a great mistake is made in many cases where a permanent bridge is set.

You have all been troubled by the pendulous gum which is frequently found where a rubber plate has been worn a number of years. It generally extends from the second bicuspid on one side to the same tooth on the other, and is very annoying. In many cases we have found it necessary to remove this gum surgically, but there is another method of procedure. Place some oxyphosphate of zinc in the old plate, and crowd it into position while still soft. After this has been worn a few days, put in a little more cement, and by pressure you can remove all this tissue.

Discussion. *Dr. J. W. Cormany,* Mt. Carroll: You speak disparagingly of rubber plates, but of course we have to use them in the country. Suppose you had a case waxed up, and you heated the flask to warm up the wax a little, but overdid it and the wax melted and ran all round the teeth. Then suppose we finish vulcanizing a plate and forget about it for a few hours, how do you remove the granular plaster which sticks so? In the first case I cool the flask off at once under the faucet and then boil out the wax, and in the second case I clean off the plaster with a brush and pumice stone.

Dr. Pruyn: In both these cases I know no better procedure than yours.

Dr. G. M. Brunson, Joliet: What do you think of rubber plates with aluminum lining?

Dr. Pruyn: I don't think much of them, as the rubber is still there and retains the heat just the same. I forgot to mention one point—the repairing of rubber plates. Suppose the plate has been broken straight through the center. My method is to wax the parts together, run plaster in the palatal portion and hold the form, then take the plate off and cut out all of the old rubber that presents to the tongue, cutting up underneath the shoulders of the teeth so that the pins are exposed, then pack in new rubber, and the repair will show only in a little place on the tuberosities just back of the molars on either side. In some cases where a plate has been worn for a number of years and some shrinkage has taken place, I scrape the cast considerably, and then by mounting with new rubber I can make a better and stronger case, and perhaps save the patient the necessity of getting a new plate for a number of years.

Dr. S. F. Duncan, Joliet: With regard to removing the granular plaster from a plate, if the model has been covered with tin foil this can be simply peeled off, leaving the plate perfectly clean.

Dr. G. E. Warren, Pontiac: I am indebted to Prof. Taft of the Chicago Art Institute for the formula of a preparation that is used in the Institute for separating plaster casts. It is what you might call a saturated solution of soap-suds. Strain it and add equal parts of lard oil. A little coloring may be used if desired. This preparation is simple and inexpensive and separates cleaner than anything I have ever used. In time the ingredients will separate a little and the bottle will have to be shaken.

Dr. J. T. Dixon, Chicago: A lady presented with very prominent gums. The broken crowns of the teeth had been cut away in order to be crowned for bridgework by one of our dental parlors, and in order to get the bridge on the workman had drilled through the side of the roots. After a long and faithful effort to heal the openings I was forced to abandon the idea. The patient did not want to wear a plate because she was afraid the gum would show, so I removed the roots and used very long teeth with a short bite. I trimmed the ends of the teeth and fitted them into the alveoli, and put the plate in in that way with no gum in front. The patient is very much pleased with the satisfactory result, the teeth look natural, and I hope to retain the normal shape of the front of the mouth by having long teeth up in the gum.

Dr. G. D. Sitherwood, Bloomington: Dr. Cormany says he heated that flask to separate, to warm the wax. I supposed that every dentist nowadays in making a plate filled his flask with plaster, and when the plaster heated in setting took his hands and separated the flask without any heating whatever.

Dr. J. G. Reid, Chicago: Recently I inserted a bridge for a lady eighty-four years old. It extended from one lateral to the opposite cuspid. The two teeth stood at opposing angles to each other, and there was at least a quarter of an inch difference between the distance between the points of the teeth and the necks. I placed a heavy silk thread, about a BB silk twist, over the points of the teeth, then placed a small piece of wood between the two threads and began to twist. After an hour's slow, careful work the points of the teeth were moved sufficiently that I could slip the bridge over. It went on easily—the teeth moved back to place at once, and the patient went away comfortable and happy.

Dr. Sitherwood: I don't think plates of aluminum or Watts' metal are used as much as they should be, especially Watts' or Weston's

metal for lower dentures. Gum sections can be used if too much metal is not employed, and beautiful and satisfactory work can be made at a comparatively low cost.

A SIMPLE MATRIX.

BY W. G. CLARK, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I will present for your consideration a matrix and method of adjustment that may serve as a compromise for extremists—those who never use aids of this kind and those who favor more complicated mechanical appliances.

The material is sheet steel, rolled thin enough to be elastic and thick enough to be sufficiently stable, with a polished surface. This is cut into strips long enough to reach beyond the tooth on either side and wide enough to reach beyond the cervical margin and above the grinding surface. The cervical side may be cut in a circular form to avoid wounding the gum tissue.

We will suppose the cavity has been prepared according to the modern idea of extending for prevention of future decay, and that the rubber dam is in place. The next step I deem of great importance—filling the cervical portion and beyond the angles with pellets of tin or soft gold *before* adjusting the matrix. The filling material should be malleted against the cervical margin and allowed to lap over, then with a flat burnisher press the mass against the neck of the tooth until it assumes a form approximating the natural condition.

In cutting the steel you will observe that as the blades of the shears pass each other the edge of the strip is bent to a sharp concavo-convex form. When introduced between the teeth the convex side should be next the filling. This serves a double purpose, as it slides to place without tearing the foil, and keeps the wedge from passing beyond the edge of the matrix.

The matrix is held in position by a wooden wedge made thicker next the gum, conforming to the shape of the interproximal space, and can be made wide or narrow as the conditions require. It should usually be introduced from the lingual side, but that is not always necessary.

The pellets in place can be further condensed, cohesive gold added, and the filling finished in the usual manner. Portions of

gold may be packed in the triangular space between the margin and the strip, and the ends can be bent back to allow the insertion of a foot plugger to condense the gold thoroughly against the beveled margin.

This form of matrix is useful when filling cavities in the proximal surfaces of molars and bicuspids, and the disto-approximal surfaces of cuspids where the adjoining teeth are in position. It allows the cervical margin to be perfectly covered before it is applied, and the other margins are accessible at any stage of the operation. It gives support to the filling at the proper place—the extreme portion of the contour. It can be easily and quickly prepared and applied.

Discussion. *Dr. C. J. Sowle,* Rockford: You are probably all familiar with the fact that I demonstrated the use of separating rubber as a wedge in place of wood, over which it has many advantages. The interproximate space determines the size and thickness of the piece of rubber to be used. The matrix is placed in position and the separating rubber added. If the matrix fits tightly against the adjacent tooth, by putting a little vaselin on the rubber it can be stretched out and slipped in between. It will force the matrix to place along the cervical margin, yet will yield enough to allow the filling material to cover the margin at every point. The rubber will spread the teeth enough that when you have built the filling down to the contact point, using a very thin matrix, you will have sufficient separation to give the tooth its natural contour. Now remove the matrix, leaving the rubber in place, finish the filling on buccal and lingual margins and contact point, remove the rubber and finish with strip to the cervical margin. I believe that separating rubber saves me at least half an hour on each operation.

PORCELAIN WORK—INCIDENTS OF OFFICE PRACTICE.

BY A. W. M'CANDLESS, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

I feel that it would be almost presumption on my part to attempt to tell anyone here any one thing about porcelain work. Many years ago I saw that it was to fill a very important place in the practice of dentistry, but had I also seen the rocky road I must travel before I reached the standard of to-day I fear I should have lost courage and

at least have waited for someone else to do the experimenting. I well remember when bridgework first came out seventeen or eighteen years ago. I was opposed to it, as it seemed to me unsanitary, uncleanly and at best temporary, but I soon became convinced that it had its place, and if I were to be a progressive dentist and keep abreast of the times, I must acquire skill in bridgework, and as bridgework goes I became somewhat proficient in the work, enough so at least to convince my patients that they could trust me to have it done. So when the agitation of porcelain work began it was only a step further, and I was not long in making up my mind to climb into the band-wagon. I had the utmost confidence in the ultimate success of the work, and felt it was my duty to the profession to help solve the problem.

The first great step towards its solution was when we discovered that low-fusing bodies had not the required strength. Then we began to use high-fusing bodies, only to discover that the heat required to fuse them was so great as to weaken the metallic joints through the drinking up of the pure gold solder by the platinum. Then Dr. Ames told us to use platinum solder. Next Dr. Taggart discovered that a vital element of weakness in porcelain work was in allowing the truss of the bridge or the post of the crown to extend up too far, and told us we must get the metal parts out of the way as much as possible consistent with strength in order to get bulk of porcelain. I think I need say nothing of the preparation of the root for a porcelain crown, except to remark that I never fitted bicuspid and molar roots as accurately and nicely as I do since I began preparing them for porcelain crowns. The reason is certainly obvious without explanation. The porcelain facings should be concave to correspond to the labial or buccal aspects of the bands and extended over the entire width of the band. It is seldom necessary to have any part of the post extend beyond the cap or cope if the pins of the facing are bent downward, as they will reach the cap where they may be soldered. The porcelain to be added to conform the tooth to its natural shape should be high-fusing and finely ground, because cusps cannot be carved so well otherwise.

I always set crowns and bridges with gutta-percha, and there are many reasons for its use, one of which is that in case of accident it is an easy matter to remove a crown or bridge by the application of a little heat. For this purpose I have modified a little a contrivance of

Dr. Taggart's. I solder a little platinum tube in the metal end of a chip-blower, and connect the other end with rubber tubing to the gas jet. I then turn the gas down until I have a very small flame and apply it to the tooth, and it will quickly heat up a crown or bridge so that it can be removed. I use the Kerr electric annealer for heating the gutta-percha, and before putting the gutta-percha into the caps they should be smeared with oil of cajuput, so that the gutta-percha will stick to the metal.

Dr. C. B. Rohland, Alton: In removing bridges set with gutta-percha I simply revolve a leather wheel in the electric engine at a high rate of speed, and can make a crown so hot in this way by friction that not only will the gutta-percha be softened, but the patient will be made uncomfortable if it is continued.

Dr. C. J. Sowle, Rockford: Great care should be taken not to overheat the gutta-percha, for if that is done its firmness and sticky quality will be lost and failure may result.

Dr. H. J. Goslee, Chicago: There is no question in my mind as to the success of porcelain crown, bridge and inlay work. It is simply a question of observing the minutest details and using the proper material. The root must be properly prepared, in order that as much room as possible may be secured for the porcelain, because its strength increases in proportion to its bulk. The metal construction should possess sufficient strength, and this is made possible by the use of platinum solder, because the joint is not subsequently weakened to any extent by the refusing of the solder while the porcelain is being baked. Of course, the adaptation of the porcelain facings must be carried to the gum in order that no joint or differentiation in color shall exist. There is no physical union between porcelain and platinum. Then the joint must be made smooth, flush and continuous between facing and band. As an aid to permanency, the overlapping of the facing upon the band forms a mechanical retention for the porcelain which is placed there. Whenever we hope to add porcelain to platinum the retention must be mechanical, and as it is very desirable to have a perfectly smooth joint at this point, the overlapping of the facing, and the further precaution of having a slight space between the neck of facing and the platinum, will enable us to anchor that facing there so that it will not subsequently be fractured. A high-fusing body should be used, and a very important detail must be

watched carefully, namely, packing the material. Much of the strength of porcelain is secured by properly packing it during the building-up process. If it is mixed thin and simply poured, not so much strength is secured as could be otherwise. It should be mixed as thickly as expedient, the moisture should be brought to the surface and evaporated as the mass is built up, and the body should be condensed and packed as tight as possible. Some feel that much artistic ability is required to carve porcelain, but by setting the plaster model of a case before us we should be able to reproduce a specified tooth without difficulty. Probably two-thirds of the failures in porcelain work are due to overbaking the porcelain. By so doing we entirely destroy its integrity, its color, and are likely to take away much of its strength. I would much rather have a crown under than overbaked. Baking is simply a matter of experience, and unless one has had experience no test will avail much. It is a good plan to experiment by fusing little cubes of porcelain in the furnace. Always place the crown or bridge in the furnace so that the porcelain can be easily seen. If all these little details are observed there is no reason why anyone cannot do successful and artistic porcelain work.

REPORT OF THE SUPERVISOR OF CLINICS.

BY D. M. GALLIE, D.D.S., CHICAGO. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT SPRINGFIELD, MAY 13-15, 1902.

1. C. J. Sowle, Rockford. *Gold Filling, Using Matrix and Separating Rubber in a Mesio-Occlusal Cavity in Right Superior First Bicuspid.* The principal feature of this clinic was the use of a heavy piece of rubber between the opposing tooth and the matrix. It seemed to offer all the advantages claimed for it by the author, namely, sufficient springiness of the matrix to enable the gold to be carried over the margins of the cavity, also securing space for finishing without laceration of the gums. The filling was well finished and the contact good.

2. H. W. McMillan, Roseville. *Some Convenient Things About an Office.* Dr. McMillan exhibited a working file original in design, consisting of alphabetical placings of patients for record purposes. It was novel and serviceable; also a liquid celluloid for the repair of broken impressions and models—a good thing to have about the

office. Also a cavity-cutting outfit for artificial teeth, and several other handy articles of interest to the practitioner.

3. Geo. W. Cook, Chicago. *Individual Treatment of Pyorrhea Alveolaris.* The gentleman recommends a different treatment for different conditions of the disease. In severe cases he advises a combination of crude sulphuric acid and crude carbolic acid, making a product known as sulphonic acid. Three cases were treated, one in the opinion of the committee being calcific inflammation, and the deposits in each case were apparently removed.

4. M. R. Harned, Rockford. *Preparation of Cavities in Artificial Teeth.* Dr. Harned showed an ingenious method of cutting a groove in plate teeth with emery stone and allowing the cutting to extend through the lingual aspect of the tooth. He then vulcanized the tooth to the base plate, and, using the rubber as a foundation, built the gold in upon the rubber, depending upon the lateral grooves for retention.

5. J. W. Bridges, Chicago. *Inlays.* Clinician unavoidably absent.

6. J. J. Reed, Rockford. *Cement Anchorage for Gold Filling.* A thin film of cement is placed in the cavity, and while it is still soft a piece of crystal gold is pressed into it and the excess forced out, care being taken that cement does not flow over surface of gold. After waiting a short time for the cement to harden the gold filling is begun. Tests were made to dislodge the filling, and although pieces of gold were displaced, the filling remained. This method of anchorage seems feasible for some cases. Dr. Reed was responsible for the operating inclosures that were used, and they spoke for themselves at the clinic.

7. W. T. Reeves, Chicago. *Porcelain Inlay.* A lateral cavity in left inferior cuspid. Matrix burnished, baking and setting inlay at one sitting. The result was an accurate adaptation of the inlay to the margins and walls of the cavity. Slightly off in shade, but otherwise a very artistic operation.

8. F. S. Trickey, Freeport. *Gold Filling.* Clinician unavoidably absent.

9. H. J. Goslee, Chicago. *Construction of Saddles for Porcelain Bridges, and Carving Cusps for Crown and Bridgework.* Also an ingenious method of wiring the teeth together in case of fractured maxilla with 24-gauge German silver wire. This method has many

advantages over the old and more cumbersome interdental splints. Also a neat and effective scheme of drawing the edges of a gold crown to adapt it to the conformation of the root after the crown is set. It consisted of a loop of 24-gauge G. S. wire, engaging the cervical circumference of the band, and with lingual surface flattened. A few twists of the wire will cause the edges to bend to conform to the irregularities of the root.

10. R. J. Cruise, Chicago. *Extraction and Replantation.* No suitable case presented.

11. B. J. Cigrand, Chicago. *A Gnathomonic Mimic Showing the Philosophy of Mastication.* This instrument demonstrates to a nicety the principles involved in the Bonwill system of articulation. As we understand it, the articulator is the embodiment of the ideas of Dr. Cigrand, and makes possible all movements of which the jaws are capable. While the Committee recognize the importance of this instrument, we question the feasibility of saddling another addition upon our nomenclature.

12. K. B. Davis, Springfield. *Crown and Bridgework.* Clinician ill.

13. L. O. Green, Chicago. *Banded Logan Crown.* Clinician absent and sent no explanation or excuse.

14. L. S. Tenney, Chicago. *Gold and Platinum Restoration, Using Engine Mallet.* A superior right central, distal surface to incisal edge. Cavity prepared in accordance with accepted theories, and restoration complete. A successful operation in every way.

15. C. P. Pruyn, Chicago. *Removal of Pulp by Pressure Anesthesia.* Left superior first molar with large occlusal cavity and exposure of pulp. Dam was adjusted over both adjoining teeth, softened decay removed, and small pledget of cotton saturated with an alcoholic and ethereal solution of cocain hydrochlorate introduced into the cavity. Then a piece of vulcanite rubber size of cavity was placed on the cotton and pressure was applied with a large burnisher. For an instant only there was a little pain, and in three minutes anesthesia was complete. A large bur was then used to open the pulp chamber, and the pulp was thoroughly and painlessly removed with a barbed broach.

16. C. B. Sawyer, Jacksonville. *Gold Filling in Labio-Cervical Cavity, Using Clamp of Own Design.* The principal feature of this clinic was the excellence of the clamp, it being especially applicable

to labio-cervical cavities, having three points of bearing—labial, lingual and coronal. The filling was good in execution and finish.

17. E. R. Carpenter, Chicago. *Removal of Pulp with Pressure Anesthesia.* Inferior left second bicuspid, mesio-occlusal cavity, pulp exposed. A successful demonstration of this method of removing pulps. Technique the same as that of No. 15.

18. E. F. Hazell, Springfield. *Gold Filling in Superior Right First Molar, Using Matrix.* Mesio-occlusal cavity. Filling started with Solila gold and finished with Ney's foil. Condensed with engine mallet. Cavity prepared according to the methods taught at present. Filling well finished and the contact point good. The Committee believes this cavity could have been filled just as well without using a matrix.

19. J. E. Hinkins, Chicago. *The Use of Kowarska's Cement as a Splint for Loose Teeth.* After thoroughly removing deposits and cleaning teeth at previous sitting, Dr. Hinkins applies the dam and ligates the teeth with floss in the usual figure eight. He then applies the cement carefully with a spatula, covering the ligature and surface of teeth, and allows about an hour for cement to harden, polishing at subsequent sitting. His formula for the cement is—Celluloid 160 parts; Acetone (Merck) 400 parts.

20. W. Girling, Chicago. *A Porcelain Crown Built Solidly from the Platinum Cap to the Proper Occlusion Without the Use of the Ordinary Facing Soldered to the Cap.* The platinum cap is made in the ordinary way, with dowel pin slightly above the surface of the cap. The platinum surface of the cap is well roughened with a file to give the porcelain good attachment. The porcelain is shaded from the beginning to the enamel surface, to match the adjacent teeth by means of different layers of the necessary shades of porcelain, to produce the natural effect. Doing away with any grinding and the extra strength gained by one solid mass of porcelain, are the desirable results obtained. The crown when completed was an artistic piece of work.

21. C. S. Case, Chicago. *New Form of Artificial Palate.* The principal features of Dr Case's new method of constructing an artificial velum are—1. The introduction of a flexible wire to be used in forming the posterior border of the model of the veil. 2. The ability to see the posterior wall of pharynx above the wire. 3. The ease with which the wire may be made to take the correct shape by

being able to see the wall of pharynx above the wire. 4. The construction of a thick roll of rubber to form the border of velum, preventing curling of the veil, but allowing an easy movement.

22. G. B. Perry, Chicago. *Mounting and Turning Lathe and Engine Wheels.* Clinician unavoidably absent because of sickness.

23. J. O. Brown, Chicago. *Gold Filling.* Clinician failed to appear and sent no explanation or excuse for his absence.

24. Hugo Franz, Chicago. *Surgical Healing of Chronic Alveolar Abscess.* Clinician present, but no suitable case could be found.

25. Edmund Noyes, Chicago. *Root Canal Filling.* Hill's stopping and eucalyptus extract were used. The canals filled were in an upper molar, from which Dr. Pruyn had removed the pulp but a few moments previous. There was considerable hemorrhage, and one canal was so constricted as to make the upper portion very difficult of access, but after patient and careful manipulation all the canals were thoroughly filled. After bleeding ceased the canals were freed from moisture by repeated applications of eucalyptol, and wiped out with cotton on a broach, a slight amount of eucalyptol remaining on the canal walls, more in the small than in the large one. A very small, cone-shaped portion of Hill's stopping was placed upon a hot instrument that was small enough to go far into the canal. The cone, already softened by heat, was dipped in the eucalyptol, carried into the canal and worked by a churning motion as far up as possible. Then a fine roughened broach, slightly moistened with eucalyptol, was used to churn the material until no doubt remained that it had reached the end of the canal. The filling was completed with warmed points of Hill's stopping worked in with a hot instrument. In very small canals the first portion must be made thinner or more plastic by the addition of more eucalyptol, but the amount of this should always be as little as will suffice for successful manipulation. This method of root-canal filling is rather slow, and in some cases requires a great deal of time and patience, but it is vastly better than to fill the canal with a thin solution of chloropercha and thrust into it a cold gutta-percha point. These latter fillings are almost always in an unsatisfactory condition after a few years.

26. R. C. Brophy, Chicago. *Porcelain Work. Baking with Gas and Gasoline, Using His Own Furnace.* Gasoline furnace was used and a number of crowns were successfully baked, which proves that

country practitioners may use porcelain in their practice with success.

27. C. F. Bryant, Chicago. *Continuous Gum Denture.* The teeth were attached to the plate, and their arrangement was very artistic. The mixing of porcelain body and applying it to a metal plate was fully demonstrated. One baking was completed when the electric current failed and prevented the finishing of what promised to be an excellent clinic.

28. G. M. Brunson, Joliet. *A Method of Anchoring Screw Posts in Frail Roots and Badly Broken Down Bicuspids and Molars.* The screw is platinoid wire No. 30, with threads so cut as to readily screw into the roots, going about one-third their length. The cavity may now be filled with amalgam to complete restoration, or built up so as to retain a gold crown. We can see many places for the use of this platinoid screw.

29. S. J. Knowles, Chicago. *Porcelain Inlay (Wassall's Method).* This was an exceedingly fine clinic. Specimens were mounted to show the progressive steps in the completion of the process. After a cavity is prepared for an inlay the bite is taken in modeling compound to be used as a guide in contour and occlusion. The cavity is then dried and thoroughly rubbed with talcum powder. A stiff copper matrix, as heavy as the case will allow, is adjusted and an impression of the cavity taken in cement, considerable pressure being used. The impression is easily removed by first taking off the matrix. The modeling compound bite is poured in plaster and the impression invested in plaster to support any frail extensions of cement. When the plaster is hard the impression is trimmed so that it will show but little more than the margins of the cavity. The impression is then rubbed thoroughly with talcum powder, and cement is mixed rather thick for a top or model of cavity. Care should be taken to have sufficient bulk of cement to prevent the model from fracturing from subsequent swaging. The reproduction of the cavity is next invested with plaster in a small round tray, called the "bed plate" in Brewster's new inlay swaging outfit. The model, which is an exact reproduction in cement of the cavity, is now ready for the process of swaging the matrix. Platinum foil 1-1,000 inch thick is thoroughly annealed, placed over the model of cavity and partly burnished to place. It is then put in the Brewster inlay swager, cotton being placed between matrix and swager, and an-

nealed and swaged the second time without the use of cotton. The matrix is then removed and trimmed. It is annealed again and then forced perfectly to place by the rubber water bag plunger of swager. It is then ready for baking, and three or four bakings are necessary. To prevent shrinkage, a piece of porcelain tooth is ground to exactly fit from one margin to the other and the foundation body is fused around it. After each baking the inlay can be placed in swager and pressure be brought on it so that there is no chance for it to change shape through shrinkage.

30. F. B. Noyes, Chicago. *Test of Amalgams for Shrinkage or Expansion.* Twelve fillings were made by eleven men, but because of their inexperience in making fillings in the test tubes the measurements of some fillings could not be taken, the contact disc being loose and moving under the micrometer point. Only four alloys were represented, namely, Fellowship, True Dentalloy, 20th Century and Rego. The microscope could detect no movement in any of the fillings. The micrometer recorded an expansion of from ½ to 2-10,000 of an inch for Fellowship alloy, 1½ and 2-10,000 for True Dentalloy, 2-10,000 for 20th Century and ½ of 1-10,000 for Rego. One filling was made of Rego, one of 20th Century, two of True Dentalloy and eight of Fellowship.

31. G. D. Sitherwood, Bloomington. *Treating and Wiring Loose Teeth.* Case of six inferior anterior teeth very loose from calcific deposits. All deposits were thoroughly removed and gums treated; the teeth were then ligated with No. 26 to 30 gauge soft annealed brass wire, the ends of which were turned in between the teeth. When operation was completed the teeth were quite firm.

32. Grafton Munroe, Springfield. Dr. Munroe exhibited some models showing his method of taking impressions for crowns and bridgework; also a case of orthodontia, in which he has attained excellent results. At the start the teeth in both jaws were very irregular, the inferior cuspids standing outside the arch. The Doctor has succeeded admirably in the regulation of both jaws, and has made a wonderful improvement in the appearance of the child.

33. F. H. Skinner, Chicago. *The Preparation of Sensitive Cavities, Using Nitrous Oxid with Hurd's Inhaler, and Gold Filling.* The patient was partially anesthetized and a large linguo-occlusal cavity in inferior right second molar prepared. Patient stated that at no time during the preparation did he experience any pain. The

cavity was then filled with non-cohesive gold and tin to prevent thermal changes, and the filling was finished with cohesive foil. The margins of the filling were perfect, and the finish and occlusion were good. Dr. Skinner also successfully extracted six teeth, using the Hurd inhaler.

34. Geo. C. Appel, Chicago. *Gold Filling.* Clinician unavoidably absent.

35. J. E. Nyman, Chicago. *30th Century Filling.* Upon arriving at Springfield Dr. Nyman discovered that he was still living in the 20th Century, and consequently postponed his clinic for 1,000 years.

36. Lester Bryant, Chicago. *Construction and Shading of Porcelain Inlays.* This was a table clinic, in which Dr. Bryant showed great familiarity with the working of porcelains.

37. R. N. Laurance, Lincoln. *The Use of Flexible Rubber as a Lining for Lower Dentures.* The process consists in so investing the case that the model will be the thickness of a sheet of rubber below the surface of the plaster in the lower half of the flask. The model is coated with flexible rubber dissolved in chloroform, a sheet of flexible rubber cut to pattern is attached to the model, and a piece of cloth used on sheet rubber, boiled out so as to eliminate the starch, is placed on the lower half of flask. Pack the upper half of flask with ordinary rubber, place flask together, and screw down in the usual way. When sufficient rubber to fill space perfectly is evident, remove cloth, close flask and vulcanize.

38. J. E. Elmer, Bloomington. *Gold Filling Restoration.* Cavity in right superior central extending across the tooth and involving about one-third of distal surface over to the mesio-incisal angle. Cavity was carefully prepared and filled with gold condensed with hand and automatic mallet. Margins good and filling well finished, but appeared a little short at the disto-incisal angle.

39. J. N. Crouse, Chicago, Prepared a Disto-Occlusal Cavity in an Inferior Left First Bicuspid, and Filled With Fellowship Cement.

M. L. Hanaford, Rockford, exhibited a filling inserted two years ago for Dr. Backus on the distal surface of superior left cuspid. The filling was in excellent condition.

J. E. Nyman, Chicago, exhibited a porcelain crown placed in the mouth of Dr. Sowle three years ago. The crown looked well and the gingival margins of the gums were in a healthy condition.

R. B. Tuller, Chicago, exhibited an instrument of his own invention, with two small rubber caps for the compression of cocain and carrying medicines to cavities. It is a very handy little device.

R. J. Cruise, Chicago, exhibited an extracting instrument that was used before the turnkey. It was quite a curiosity.

ANATOMY, PATHOLOGY AND SURGERY—REPORT OF SECTION V.

BY THOMAS FILLEBROWN, D.D.S., CHAIRMAN, BOSTON. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY 28-31, 1902.

The discoveries during the past year in the branches of Anatomy, Pathology and Surgery do not bring marked addition to our knowledge, but the discussions upon these subjects show a decided advance toward a better understanding of many problems, and give promise of determining satisfactorily in the not distant future many of the points that have long baffled explanation. It will be impossible in the space and time which I can be permitted to occupy to give anything but the merest outline of only a part of the work upon these subjects.

The only definitely new discovery is of an additional bone in the foot, by Professor Thomas Dwight, which he has found in a sufficient number of cases to entitle it, he thinks, to a permanent place in the list of normal bones of the foot.

Dr. David Riesman and Dr. A. O. J. Kelley have contributed a valuable article on the relation of bacteriology and pathology. One of their interesting statements is that aseptic wounds are rarely sterile—of forty-three cases examined but eleven were found so. Staphylococcus pyogenes albus was commonly the infecting agent. The greatest number were found on the second day of healing. They believe that "aseptic fever" is due to the absorption of organic materials and the products of bacterial metabolism from the wound.

They seem to credit the statement that carcinoma is increasing, and quote from the report of the Committee of the British Medical Association that the physical conditions where carcinoma prevails are contamination of the soil with sewage, and general lack of drainage. Evidence is adduced that there is a special tendency to the occurrence of malignant disease in certain houses and groups of houses, and on

the whole carcinoma is reported to be more prevalent in old houses and districts than in new ones. (*Year Book of Medicine and Surgery.*)

Dr. James Ewing has made some valuable contributions to the pathological anatomy of malarial fever, showing the effect of the disease on the various organs of the body. No member escapes its baneful influence. His account of its destructive effect upon the marrow is interesting from a dental view. Cellular hyperplasia is pronounced, the nucleated red cells are abundant and lymphocytes are overabundant, while fat cells are atrophic. The blood shows anemia of the chlorotic type, with a marked tendency to develop the signs of pernicious anemia. The condition has, of course, a depressing effect upon the osseous support of the teeth and must be recognized as one efficient cause of the atrophy of the alveolar walls. (*Journal of Experimental Medicine.*)

Dr. A. Michel finds that the saliva has a great influence on caries of the teeth, and that the quality of the drinking water influences the composition of the saliva. He finds that the water of Wurzburg has fifty times as much calcium oxid as that of Lohr, and the calcium oxid of saliva taken from the inhabitants of Lohr is only one-sixth that found in the saliva of the inhabitants of Wurzburg. Dr. Michel came to the conclusion that where a lessening of caries is found there is an increase in the amount of sulphocyanic acid and an increase in the alkalinity of the saliva.

The second annual report of the Cancer Committee of the surgical department of the Harvard Medical School was presented in February, 1902. The Committee is making systematic efforts to fix definitely the cause of cancer. The great diversity of opinion in regard to it makes the task a laborious one. These differences are emphasized by the fact that of eminent scientists twenty-seven believe in the contagiousness of the disease, eight believe that it is not contagious, sixteen believe that bodies found in cancer are degenerate epithelial cells, while eleven believe that these bodies are parasites. So we must wait a little while for a solution of the question.

Dr. Miller discusses the presence of bacterial plaques on the surface of the teeth. He denies that a film on the surface of a carious surface can be taken as evidence that the film gives rise to the caries. Three jaws which he examined did not show a trace of tooth caries, yet all revealed a normal extension of the film when stained with

eosin, and the teeth of his colleague, who is immune to caries, presented as fine a growth of film as one could desire, only the cusps of the teeth being free. Other writers have conceived that caries was bound to follow the presence of a film, under which the bacteria were sure to be present and carry on their destructive process. Dr. Miller thinks that in some cases the film serves as a protection to the tooth instead of a menace. (*Cosmos,* May, 1902.)

W. Arbuthnot Lane offers some new ideas on the form of the alveolar arch. He maintains that besides the presence of the teeth there is an additional factor controlling the development of the upper jaw that does not influence the lower jaw to anything like the same extent when movement of these bones upon one another does not exist. Second, that in a normal skeleton the lower jaw is dependent for its perfect development upon that of the upper jaw. He thinks that respiration has also great influence upon the development of the jaws, and substantiates his position by photographs of children bred under conditions unfavorable to full respiration. (*Clinical Journal,* Vol. XVII.)

Phagedenic pericementitis comes in as usual for discussion during the past year. Dr. Wright has contributed an excellent article which throws considerable light on this much-discussed subject. (*Cosmos,* February, 1902.)

W. Booth Persall, F. R. C. S., in the *Journal of Anatomy and Physiology,* has proposed a new method of comparing the anatomical formation of the teeth by the use of diagrammatic outlines instead of drawings. He thinks his method produces more accurate results, and his arguments make the scheme more desirable.

A new method of administering electricity for local anesthesia has been suggested. M. Regnier, head of the laboratory of electrotherapy of the Charity Hospital, and M. Dydsbury, of Paris, describe it in *La Nature.* The operation is the placing of a simple conductor (using an arrangement of M. Gaiffe) in connection with an electrode to be applied to the region to be anesthetized. Thus far the experiments have mainly been tried in the operations of dentistry. An account submitted to the French Academy of Sciences says that in fourteen cases of extraction of monoradicular teeth thirteen cases of complete insensibility and one of relative insensibility were produced, the current in the one instance having been applied only thirty seconds. But although the method is so new, there are already indi-

cations that it will soon be applicable in the most severe operations of surgery. M. Billenkin, a surgeon at Epernay, reports that he has been able to use electricity in cases that up to this time have required the employment of chloroform. He mentions an operation which was performed without any pain to the patient, involving the removal of a large hemorrhoidal mass.

Dr. Joseph Head has contributed an article on a method of bleaching the enamel of teeth with living pulps. He isolates the tooth with rubber dam, applies pyrozone, and while the tooth is still wet applies an instrument as hot as the patient can readily bear. This, he contends, drives in the steam from the hot instrument and also liberates the nascent oxygen that is in the enamel. The true value of this can be determined only by repeated experiments. (*Items of Interest.*)

An interesting and perhaps the most important contribution of the past year is furnished by E. C. Kirk, on the Chemical and Clinical Study of Erosion. He states that he believes dental erosion is a constitutional disorder with a local manifestation, and that it presents two types. He also states that he has demonstrated the cause of one type of erosion to be lactic acid, and of the other type to be exudation of acid sodium phosphate. The first type is due to fermentative processes in the mouth, and the second to a disordered condition of certain buccal mucus glands. The article is worthy of not only a reading but of careful study. (*Items of Interest.*)

PRESIDENT'S ADDRESS.

BY J. A. LIBBEY, D.D.S., PITTSBURG. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT NIAGARA FALLS, JULY 28-31, 1902.

There have been various attempts to mark by some distinguishing title the character of our age. Its tremendous commercial and manufacturing energy; its wonderful discoveries, especially along the line of electricity—the brilliant adaptation of this force to practical life—have seemed appropriately to designate the age. But we are proud to be able to choose a still stronger designation, and call it the age of remarkable increasing benevolence. The gifts in behalf of education, amounting each year to many millions, have become to us a commonplace subject of felicitation; while they excite the wonder and are beginning to stimulate the same spirit in other people. But it may be well for us to ask ourselves whether it is not part of our responsibil-

ity to direct somewhat the current of this noble giving, so that some of its power and blessings shall flow into our work. We sympathize with every effort to develop universities and the opportunities for technical and manual training; we rejoice in all that instructs brain and hand; but we shall rightly ask for a place, remembering how greatly our profession needs increased facilities and the advantage of these opportunities to hasten a progress greater than that of the past. Ministering as it does to the health and happiness of the community, our profession has an unselfish platform from which to appeal for our share in these generous gifts. If we are to fully develop our science; if we are to train students who will make fresh discoveries and increase in skill—who will be able to give to suffering thousands the results of a science completely mastered, we must have a more perfect education.

The proposed lengthening of the course of study is at once an evidence of our desire to send out more skillful practitioners and unite our larger skill to the great needs of suffering humanity. I allude particularly to the National University, the Polytechnic School of Pittsburg, the prospects of enlarged university facilities, and the Evans' fund. I recommend that a committee be appointed to look after the interests of our profession in this matter. The New York State Dental Society has taken the initiative step, and this Association should give all the assistance it can. It seems to me it would be better to do this work in the name of the National Dental Association, giving the New York Society due credit and a representation on the committee.

The National Dental Association is a delegate body representing the organized dental profession of this nation, and being a delegate body, its work is for the benefit of the whole organized body of dentists. Its membership is not merely the few who come as delegates and bear the burden of the work and expense, but every member of a state or local society which is represented by a delegate is in the same relation to this Association as every citizen is to our government. A citizen is a supporter of the government—this country is governed by representatives elected by the people, and the same rule should prevail in this Association. Our work is for the advancement of the whole profession and should be supported by it, instead of the burden falling exclusively upon those who devote their time, energy and talents to the work. It is the duty of every society represented

in the National Dental Association to acknowledge its allegiance to it by contributing to its support. If every society would pay the small tax of one dollar for every delegate to whom it is entitled, it would increase the fund in the treasury to such an extent that this Association could accomplish vastly more than is possible under the present plans. We could encourage investigation to a greater extent, we could print our own journal, and place it in the hands of the members immediately, all the journals having the same opportunity of using any of the material they wish, instead of making a privileged journal, and having transactions come to the members as evidence of something that has gone before. As the permanent membership increases it is losing its identity as a delegate body and assuming an individuality—merely a society—and as such its influence with the organized profession will decrease. Let us maintain the representative character so ably advocated by Dr. Black in his address last year.

Legislation. One more state, Ohio, has by an act of legislature joined the ranks of those requiring examination for license. I regret they were unable to place the nominative or selective power with the state society (as no one is as competent to select examiners to conduct a professional examination as members of that profession who take an active interest therein); also, the placing of examination papers on file in the State Department. The discretionary feature is a good one if it is so guarded that abuse of that power cannot result.

In Pennsylvania the five schools and the state board of examiners have always worked in harmony. Since the establishment of the law of 1897, requiring examinations of all in possession of a diploma, and desiring a license to practice in the state, they are working together to improve the conditions from an educational standpoint, and the results have been a marked improvement in the personnel of the students, as well as in their training in the different branches. Quite a rivalry seems to exist among the schools to have their students make the best average in the examinations, and with this spirit extant good results must necessarily follow. All possible safeguards must be adopted to secure perfect fairness in examinations, if such commendable rivalry is to be maintained, instead of competition on lower planes.

The state supervision of dental education and the licensing of practitioners in Pennsylvania are greatly safeguarded through the work

of the Dental Council, a body composed of the State Superintendent of Public Instruction, the President of the State Board of Health, the Secretary of Internal Affairs, and the President, for the time being, of the Pennsylvania State Dental Society. The Council passes upon the credentials of the applicant, including the matriculation requirements which have been recorded by the Superintendent of Public Instruction. A card of admission to the examinations is then given to the applicant to present to the board. As soon as the examination is completed a report of the marks on individual branches and the general average, signed by each member of the board, is sent to the Secretary of Internal Affairs, who is also secretary of the Council, and placed on file for five years, subject to public inspection the same as any conveyance of land.

The members of the examining board are nominated by the state society, two for each vacancy, and from these names the Governor shall appoint the required number. They must be members of the state society (which is a representative body of the dental profession of the state), in good standing and have had ten years' practice. There is no act of the board which is not by law open for public inspection. In addition, the State Department issues a report of the work of the board, including the name of the applicant and college, and the marks on each division with the general average. All the questions are likewise submitted, but in case of failure the name of the applicant is withheld.

The licenses are issued by the Council, signed by its President, the Superintendent of Public Instruction, the Secretary of Internal Affairs, and by each member of the Board of Examiners; therefore the examiners are a part of the educational system, and not, as frequently alluded to, a committee for enforcement of law. If all the states would adopt a law similar to this there would be no occasion for the criminal charges brought against a member of a state board last year.

I have taken the liberty to call your attention to the Pennsylvania law because its enactment was the culmination of ripe consideration of the principles which the dental profession of that state felt should govern our standards of education. Five years' experience in its practical operation has demonstrated that it is founded in equity to all concerned; hence it has been productive of a better class of licenses by eliminating the unfit, and has enlisted the harmonious and cordial support of the teaching institutions of the state.

Recent Publications. We have among recent publications, "Answers to Questions Prescribed by Dental State Boards," by Robert B. Ludy, M. D., Philadelphia, Conover Publishing House. The first sentence of the preface is, "To pass creditable examinations is the laudable ambition of every earnest student. Many persons having an adequate knowledge of the subject in which they are tested fail because of their inability to interpret properly the intents and purposes of the questions to be answered by them." The July *Cosmos* in its bibliographical department expresses my views so clearly that I refer you to it instead of quoting it. The function of the state board is to discover the student's general knowledge of the subject, which it cannot do in an answer of one, two or three sentences. The students who depend on this cramming process will not make high averages. I believe it is our duty to express our views as stated in the article to which I refer, "That we are firmly opposed to the idea which prompts the publication of a work of this character, for the reason that we do not believe it to be subservient to any legitimate educational end."

Honorary Degrees. The New York legislature, in a bill signed March 28, 1901, gave to the Board of Regents authority to exchange the M.D.S. degree for the D.D.S. degree, the former (M.D.S.) being strictly a local degree conferred by the Dental Society of the State of New York, and the said Board of Regents at its annual meeting, July 1, 1901, declined to exercise the power conferred by the act quoted and referred the subject to the Dental Society of the State of New York for a definite report on the matter. The National Association of Dental Faculties at its meeting last year tendered a vote of thanks to the Board of Regents for its action, accompanied by a protest against any attempt to confer honorary degrees. At the last meeting of the Dental Society of the State of New York the act of assembly conferring this questionable power upon the Regents was approved by a large majority. Standing Resolution No. 6 of this Association, which is in force at this time, is as follows—"*Resolved,* That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice." It would seem to be the duty of this Association, representing the organized dental profession of the nation, to give an expression of opinion upon this matter.

Dental Surgeons' Corps, U. S. A. The Surgeon General of the Army, in answer to my request, informed me that he had made application to the War Department that Dental Surgeon John Hess of West Point (one of the Examiners of the Army Dental Corps) be detailed to attend this meeting as its representative. I suggest that he be requested to give us some information as to what is being accomplished by the Corps. I have received letters from different members of the Corps, giving in detail their method of procedure in examinations, operations, etc., as well as the amount of work accomplished; all of which shows the wisdom of the Department in establishing a Dental Corps in the Army.

The Committee on Army and Navy Legislation have been engaged in active work with the view of establishing a commissioned Dental Surgeons' Corps in the Navy, and making the Army Corps a commissioned instead of a contract Corps. While they have not met with the success hoped for, they are sanguine of success in the near future, the question of rank being the principal stumbling block. This Committee should be continued and instructed as to the rank for which they should contend.

The relation of dentistry to the defensive arm of the National Government is in reality but one aspect of that still broader problem of the relation of our profession to the public health. The subject is as yet in its infancy, notwithstanding the fact that much thought and labor have been expended upon it, especially in a few European countries. Our rate of progress in this department of our profession is at present comparatively slow, mainly because of the lack of a ripened public sentiment necessary to the support of our efforts in that direction. That sentiment must be created, and it would seem that the intention of the thoughtful public could be best directed to the matter by an authoritative presentation of the existing need of intelligent dental care as a health measure. Such presentation to be effective must be based upon an exhibit of the conditions which result from the impairment of the teeth and diseases of the oral cavity due to ignorance and neglect, and this Association should take such steps as it may deem wise and effective to secure statistical data upon which may be based conclusions worthy of general dissemination, with a view to not only correcting existing evils, but of demonstrating the vital importance of our ministrations to the public health.

The International Dental Federation. The International Dental

Federation and International Commission of Dental Education will convene at Stockholm on August 12. The questions to be discussed by the International Commission of Dental Education as published by its officers are—1. What preliminary knowledge is necessary for the dental student? 2. What part of the medical and scientific subjects should be taken up, and at what time of the period of training should the study of them be pursued? 3. What is the importance of the theoretical technical knowledge? 4. What is the importance of the practical technical knowledge? 5. What are the most appropriate names for the several titles now used throughout the world? The Federation will consider these essential points in aiming to establish a harmonious educational system throughout the countries of the world.

The purposes and aims of the International Dental Federation have become sufficiently familiar to the dental profession of the world through the publication of its proceedings in our periodical literature during the past year. It is therefore unnecessary for me to refer in detail to the work of that organization. I deem it, however, to be my duty as well as my pleasure to speak in terms of high commendation of the purposes of the organization, and the spirit of international fraternalism of which it is the exponent. The progress of civilization which has placed at our command the means of annihilating time and space has in the same degree brought the nations of the earth into closer relationship, and the proximity has tended to remove suspicion and antagonism as it has engendered mutual regard and respect.

The world's profession of dentistry has not escaped this civilizing influence, and the International Dental Federation is the crystallization of an effort to unify and harmonize the best elements of dentistry among all the nations of the earth upon a higher plane of endeavor, to the end that our effort toward the betterment of our profession and of humanity may be enhanced. I would therefore recommend that our delegates appointed to represent this Association at the Stockholm meeting be instructed to convey the greetings and the assurances of the sympathetic cooperation of the American dental profession to the International Dental Federation in its noble work.

Forty-three years ago the preliminary meeting for organizing a National Association was held in this place. How well that work was done has been demonstrated by the progress that has been made

along all the lines of our profession. Few of the organizers are left, but their work will go on and they will live in our professional history as those who planted that their children might reap. They sowed the seed, we are reaping the harvest. Let us always keep alive the same professional spirit, cultivating the soil in which they labored, so that those who come after us may enjoy the larger fruits of our endeavor.

GALVANISM, GOLD, AMALGAM, AND THE HAHNEMANIAN THEORY.

BY R. C. GRANT, M.D. READ BEFORE THE ROCHESTER DENTAL SOCIETY, APRIL 8, 1902.

It seems to me the great mistake has been made by the gentlemen of your profession arraying themselves irrevocably on one side or the other, for or against amalgam fillings; seeing on the one hand nothing that was bad or dangerous in them, and on the other nothing but harm and suffering from their use. I do not suppose there are many to-day who would attempt to deny that a galvanic current may be and generally is produced where there are metallic fillings of different kinds in a mouth; that is, if a gold filling be placed in a mouth with amalgam fillings, the saliva acts as the exciting fluid and galvanic action occurs. If the secretions have become acid from decomposition of any particles of food that have adhered to the teeth this galvanic current is greatly increased, but even in the normal alkaline secretions it is readily detected.

Up to a certain point galvanism may produce a beneficial effect, and by its stimulating property actually assist tissue growth or building, but if long continued the inevitable reaction, which pervades the whole domain of drug action, is sure to set in, and hyperesthesia and tissue degeneration occur, and we have that most deplorable of all patients, the neurasthenic. The galvanic current produced by the presence of gold and amalgam fillings in the same mouth may not be of sufficient intensity to produce this effect in all or in many cases, but those who are susceptible to this kind of action will surely be affected, and the greater the susceptibility the more pronounced and lasting will be the symptoms. Then there is another effect which is easily produced by galvanism in the mouth that is still more serious. One of the commonest elements found in the mouth is salt or sodium

chlorid. This chemical combination is broken up by the electric current, and the chlorin may form with the mercury of the amalgam chlorid of mercury, which is one of the most active forms of mercury known, and is a drug that has a cumulative effect in the system, so that the most minute quantity if repeatedly (not to say constantly) absorbed into the organism will be almost sure to exert in time a profound systemic poisoning. Then where there is a wearing surface of any size and number of amalgam fillings there must be some minute quantity of the metal worn away, and, of course, absorbed by the system. Now do not imagine that I am insensible to the infinitesimal amount that this would be, but I mean to show later that the quantity has actually little to do with the effect produced; simply the susceptibility of the patient to the drug.

Let me say here, that the stock arguments against the theory of mercurial poisoning from amalgam and red rubber in the mouth are weak and unscientific. First. It is said that there is only occasionally a man who fancies he sees these dire effects, where there are hundreds who do not. In answer I will say, that the failure of any number of men through carelessness, lack of observation, or lack of opportunity to observe, to see these effects does not negative the facts that are seen and understood by even one honest observer.

Second. Salivation being a known symptom of mercurial poisoning, it is held to be a test, and the absence of salivation is a conclusive argument with these gentlemen that no mercurial absorption has taken place. Now be it known that salivation is only one symptom, which may or may not be present, and is shown only in the poisoning by crude doses, except here and there a case where the patient is most susceptible to the action of mercury.

Third. It is claimed by the critics that the symptoms reported are scarcely alike in any two cases, and are often at variance with the toxicological effect of mercury. Especially was this argument used by the editor of a dental journal in criticism of some cases reported by Dr. Tuthill of Brooklyn. I took the pains to compare the symptoms of those cases with the homeopathic provings of mercury, and found the pathogenesis of the drug to cover very nearly every symptom that he reported. Furthermore, in poisoning by minute doses of any drug the symptoms produced will be modified by the idiosyncrasies of the patient, and no two victims will show the same set of symptoms.

I have referred repeatedly to the susceptibility of patients to drug action. This is a well known and indisputable fact, and it is a further fact that one individual may resist disease action or drug action perfectly at one time and under certain conditions, and at another time, or under other circumstances, will succumb to the action of the same disease or to the same drug. It seems unnecessary to cite instances of extreme susceptibility, such as a well authenticated case of a lady who would become nauseated by even holding a bottle of ipecacuanha in the hand, experiments being tried in various ways and times to try to fool her, but in vain. We all know of people who will show violent symptoms of poisoning by being brought into near proximity to poison ivy, without in any way coming in contact with it except the emanations conveyed through the atmosphere.

Perhaps all of us have had cases of neurasthenia due to either galvanism or mercurial poisoning, that we relieved with more or less dispatch, and never realized the cause, for it is well known that if such patients relapse they are more likely to go to a new physician than back to the old one. Again there are others who may have been convinced in their own minds that the cause of the suffering was the fillings in the teeth, but who could not bring conviction to the mind of the patient with sufficient force to induce him to have the fillings removed, and so to prove or disprove the diagnosis.

Doubtless the methods of "proving" drugs and recording symptoms for the building up of the homeopathic materia medica is familiar to you all. Suffice it to say, that the homeopathist knows nothing of the value of a drug for therapeutic use except as he has learned of its action upon people in health. In order to get at the whole pathogenesis of a drug many provings are made on scores of observers, using doses ranging from the largest that can be borne by the system without fatal effect to the most minute doses possible to conceive, and it is an incontrovertable fact that the smallest doses will always bring out the greatest number of symptoms and the subtlest effects. This is a fact that has been observed by all of the best men of our school of medicine for the past hundred years, and it is not in dispute.

This, then, will account for the great variety of symptoms, and the lack of the grosser or cruder ones, in the cases of mercurial poisoning that have been so frequently reported by dentists and physicians. It is generally conceded by the masters in homeopathic materia

medica that comparatively few people make good provers because of their lack of susceptibility to or observance of the symptoms produced by any except the crudest doses. I leave you to make the application of this fact to the question in hand.

Personally I have observed but few cases where I felt sure the mercury in the mouth was very harmful to the patient, but I have observed repeatedly the peculiar mercury tongue—broad, flabby, with indented edges, from the imprint of the teeth—in patients with amalgam fillings, and if this is a fact there are doubtless many other conditions which I should have attributed to this cause. In my own case I suffered for years with bleeding gums, which symptom disappeared on the removal of the amalgam fillings. There is a physician in the Hahnemann Society who had a case of typical skin disease which failed to yield to any other treatment, but got well after the removal of amalgam fillings from the teeth. But cases of this kind have been reported so frequently that it is unnecessary to multiply instances and unfair to deny their existence.

To sum up, if my postulates are accepted the deductions would be that there may be and frequently are patients who cannot bear amalgam fillings without great mental and physical sufferings; that there are many who carry them with impunity because of their lack of susceptibility; that no man can possibly tell before trial who can and who can not bear them; that it is far better where gold or bone fillings can be employed to never use the amalgam; but in those cases where nothing else will answer, either from the condition of the teeth or the financial aspect of the question, and amalgam is used, to be open-minded and fair, and ready to acknowledge the deleterious effects of the same upon the system, if they should unfortunately appear, and remove the offending substance gracefully, graciously and without excuse or apology.

Discussion. Dr. C. H. Nicholson read the following letter from *Dr. S. B. Palmer:* Gentlemen of the Rochester Dental Society: It will be impossible for me to meet with you this evening. Not knowing the views that Dr. Grant may present, I cannot intelligently discuss his paper, so will give my own methods of practice, with the reasons therefor. The greatest trouble with amalgam fillings is occasioned by the galvanic action upon the exposed surfaces of the filling and those in contact with the dentin. Unlike single metals, such as gold, tin, lead, etc., amalgam is composed of an alloy and mer-

cury. That is, the alloy is united or soldered by mercury, and presents minute elements both positive and negative. For this reason amalgam fillings are never bright when in contact with the dentin, unless heavy varnish has been used before the plug was inserted. Here we see a lesson relating to two conditions—one concerning the dentin, and the other the quality of the alloy. Oxidation tends to increase the size of the plug as rust does iron. Normal dentin furnishes less moisture to increase circulation or chemical action, and the density of the dentin confines the oxid, so amalgam fillings become cemented to the walls of the cavity. To increase oxidation copper is used in alloys, giving better results in poorly calcified teeth, such as the deciduous set and the first molars. I rarely use copper in an alloy, but depend upon varnish as cement. The latter is best for devitalized and badly decayed teeth, because it prevents galvanic action upon the surface of the plug, and at the same time fills the tubuli better than the oxid.

The next point to be considered is the location of amalgam fillings, either in conjunction with gold, or even with a filling of the same material. Not only when the plugs are in absolute contact in the same tooth or cavity, but in approximate cavities which represent two distinct conditions. It is safe and good practice to use gold and amalgam in conjunction, that is, to add amalgam to an old gold filling or vice versa, or to use amalgam for a guard filling at the gingival border. The effect is to oxidize the amalgam to such an extent that the local elements as already mentioned, consisting of alloy and mercury, are obliterated. The amalgam surface is always black and smooth where exposed. In short, the positive plate in the battery becomes polarized and no current passes into the dentin. This is not so with approximate fillings, for after every precaution has been taken to avoid it, a galvanic current will be generated where a gold and amalgam filling are in close proximity.

The following authoritative statement gives the amperage, or force of currents between the plates, relative to the distance of their separation—"The quantity of electricity traversing an acid solution of uniform strength varies inversely as the square root of the distance between the plates. The distance varying from four to one, the current will be as one to two. Thus it will be seen that very small exciting surfaces may produce vigorous chemical action when the distance between them is but trifling."

The most marked disturbances are noticed when a tooth thus filled has approached its approximate, until in mastication or on becoming loosened the two fillings come in contact. Thus there is established a "make-and-break" current. The amalgam is the positive element from which the current enters into the gold. Should the dentin under the gold prove a conductor the pulp manifests the presence of a circuit. The remedy is to remove the most objectionable filling and replace with gutta-percha, perhaps temporarily. When both fillings can be made with gold all will be well. Some of our younger members may learn by experience that when a fresh amalgam filling is placed adjacent to one of years' standing, like effects upon the pulps are produced, though in less severe form.

I have had two cases for removal of fillings within a few months from the cause already mentioned. All new amalgam fillings undergo vigorous electric excitement from galvanic action occasioned by the elements of alloy and mercury. This excitement subsides when the surface by oxidation blends or polarizes the elements. At first an amalgam plug is in much the same condition as a filling of zinc would be, and we all know that a zinc plug would not be tolerated. It is well to use heavy varnish, or cement upon a coating of thin varnish, before inserting the filling.

The next disturbance is doubtless familiar to all, namely, that caused by amalgam fillings coming in contact with gold crowns, especially when the latter are used as a support for a bridge. One case will illustrate the principle. About five years ago a man consulted me regarding alarming symptoms supposed to arise from facial neuralgia, which extended to the shoulder and down the arm. An examination showed the cause to be an amalgam filling in the superior third molar. The second molar was capped with gold and supported a bridge carrying three or four crowns. Wedging was necessary to make the filling accessible, so a thin, wide strip of rubber was drawn between the filling and crown and the patient instructed to return the next day. A cure was effected over night by the separation. The amalgam filling was removed and gutta-percha inserted, and no further trouble has ensued. In this case I do not hold the amalgam responsible for any pathological influence, other than an element that aided in generating an electric current. Two other cases have been relieved. The first, incipient deafness, was due to a second molar which seemed too remote to be considered. It had

been filled with amalgam many years before. Removal of the filling showed the pulp chamber to be full of odorous septic matter. The tooth was treated, refilled, and hearing was restored. The second case presented symptoms of paralysis of neck and shoulder. About the same conditions existed, and the same line of treatment was carried out. The tooth is still giving service and there is no more paralysis.

I am convinced that some patients are more susceptible to mercurial influences than the profession realize. Before drawing conclusions I always consider well the objection to amalgam as given by the patient. I remove amalgam fillings occasionally for the possible benefit of a patient, and generally find it the right thing to do. Complaint of a metallic taste in the mouth by patients who have amalgam fillings leads me to remove all the possible causes of such taste. While I am not prepared to believe as fully in the theory of Hahnemann as a late friend of mine, who believed that if mercury were hermetically sealed in a glass tube and carried in the pocket it would affect the individual, there are grounds for believing that amalgam causes more injuries than general practitioners credit.

Discussion. *Dr. F. W. Proseus,* Rochester: There is one thing upon which we all agree, and that is that amalgam does in some patients and under some circumstances give rise to widely varying troublesome symptoms. From my own experience, if two different metals are in a mouth I am certain that a galvanic current is set up which might affect the health, beside tending toward the destruction of the fillings themselves and the dentin where in contact with the fillings. I had a patient who complained of a constant metallic taste in her mouth, and pericementitis. Dr. C., a homeopathic physician, told the lady that the trouble was caused by the presence of amalgam fillings in her teeth. I objected to removing the fillings, but finally did replace the larger ones with gold, and the metallic taste and other trouble immediately ceased. Dr. C. charged the trouble to the mercury, overlooking the galvanic action. Another case was a gentleman who had recently had a bridge inserted. There was a very old amalgam filling in one tooth, and his teeth became so sore that he could not bring them together. The filling was replaced with red gutta-percha and the soreness disappeared. A somewhat similar case was reported at the Columbian Dental Congress.

Dentists recognize that these troubles do occur, and as the homeo-

pathic school teaches that if you get an action from a drug when a large dose is administered, it will also produce an effect if the dose is small, we must allow that if gold and amalgam are present in the same mouth there will be galvanic action which will eliminate a certain amount of mercury. In many cases sufficient will be set free to constitute the homeopathic dose. Dr. Palmer says that a new amalgam filling will cause more of this galvanic action while it is bright and clean than after it becomes tarnished. For this reason it would probably be safer to use an amalgam that will tarnish quickly and thus limit this action. Dr. Palmer has been studying amalgams for forty years and his experience should be received with respect. I think we will have to admit that such results are possible, and when we receive complaints from homeopathic physicians we should treat them courteously and remove the fillings.

Dr. J. H. Beebe, Rochester: Many present remember the antipathy to amalgam which my old partner, Dr. Walter, had for so many years. The origin of his feeling arose in this way. He was doing some work for a homeopathic physician who, observing him cough frequently, pronounced it an amalgam cough and told him to remove the amalgam fillings from his mouth and he would be rid of it. The fillings were removed and the cough left him. After that he used no more amalgam in his practice. The difference is in the people. Some will be affected by the presence of amalgam and others will not, and no one can tell until it is proven, who will feel it.

Let me read an extract from a letter from Dr. Barrett to Dr. Walter, written in 1888—"You ask me why certain effects of mercury are sometimes seen in patients. Mercury is, with few exceptions, the most powerful of the metallic poisons. Its toxicological possibilities are wonderful. Combinations with other substances develop characteristics that are amazing. Analogous combinations develop the most diverse substances. For instance, mercurous chlorid (Hg_2Cl_2) is calomel, which is largely used as a medicine and is a very effective cathartic. Mercuric chlorid ($HgCl_2$) is corrosive sublimate, a poison so virulent that it has given its name to a whole class of toxicological agents. Now there is only this difference between the two substances—one proportion of mercury. In the mouth we meet with all manner of substances that are under the most favorable conditions for uniting with the mercury if it is present. The combinations of mercury are very unstable, and under the influence of heat, any free

mercury especially is readily sublimated. So here we have, if mercury be present in the mouth, all the conditions that *might* form deleterious compounds. That free mercury is inert, as has been frequently asserted, is not so, for we all know what are the dangers to which workers in mercury, especially in the mines, are liable. Some persons are exceptionally sensitive to the action of mercury as some are to every poisonous article. Some will handle Rhus Tox (Poison Ivy) without harm, others are violently affected by the merest contact. About the use of mercury in the mouth, I believe it is too powerful an agent to be used without the most extreme care. Most persons will not be affected by a moderate amount of amalgam fillings, while others cannot bear even one such filling. It may be used in moderate amount in most cases, but the dentist should exercise care. Its effects, so far as I am aware, are constitutional and not very often local. It produces its characteristic periosteal effects in the mouth and upon the mucous membrane. You know what they are. There may be cases where it produces local irritation and soreness, but I have never seen one in which the difficulty could not properly be attributed to something else. Pharyngeal and laryngeal complications are quite possible. I have under treatment now a patient the most of whose teeth are well filled with gold, but in some difficult locations amalgam was inserted. In every one of the teeth so filled there is periosteal trouble and there has been ever since they were so filled. Periosteal difficulty about the roots of the teeth in mouths in which there is a great deal of amalgam is often seen, as indicated by painless swellings of a hard character opposite the roots (indurations) which gradually increase, and unless the amalgam is removed will result in necrosis. You may ask why I ever use it. Chloroform and other anesthetics are useful in their way, but I would not use them indiscriminately to every one without examination. Chloroform and amalgam are both of great service if judiciously employed, but either is capable of great mischief if given to the wrong person."

Extract from a letter from one of Dr. Walter's patients—"I thank you for the comfort I now have. You may remember my mentioning that in winter time I was troubled with eczema in the calf of my leg. Since the extraction of the soft fillings it has entirely disappeared."

Dr. Walter once said, "One of the most remarkable cases of mercurial action, not on the system, but on gold placed in close contiguity to a large amalgam filling, was that seen in the mouth of

C. M. W. I placed a gold crown on a second lower right bicuspid, said crown being simply rolled from an English crown piece, consequently 22K fine. Immediately in the rear of the crown was a large amalgam filling which composed the crown of the sixth year molar. Six months after the gold crown was set it commenced to turn dark, until it was the color of oxidized silver and nearly as black as the amalgam filling itself. I removed the amalgam and there has been no indication of a return of the color."

Another case: Rev. Dr. R. came to Dr. Walter some time in August, 1888. Had been suffering for years, complained of dizziness and swimming vision. The least excitement caused "a darting up in front of face." Had for five years been unfitted for his profession. He was in the office Dec. 20, 1888, and mentioned voluntarily that he had not been so well in years. He would not say that it was the removal of the five amalgam fillings that had caused his convalescence, but he was certainly better and the mending commenced soon after the fillings were removed. Eyes at the former date had an uncertain and vague expression which had entirely disappeared.

Dr. Walter also had recorded cases of neuralgia, eye and throat trouble, and pimples on the face, which had been cured by the removal of amalgam fillings, the neuralgia in an hour.

Many think because the mercury is closely combined with the other metals in an amalgam that it can have no action on the system. I argued this way with a dentist who told me that at one time a patient, instead of spitting out a number of particles which became detached from an amalgam filling as he was inserting it, swallowed them, and next day had an active diarrhea. The dentist did not believe it was the mercury that affected him, however, but thought it was the irritation set up by the rough and sharp particles of metal. The same amount of sand would not have had the same effect. Amalgam does often have a deleterious effect on the system, and many patients have been benefitted by the removal of fillings. People of exceedingly nervous organisms are peculiarly susceptible.

Dr. W. W. Coon, Alfred: The coloring matter in base plate gutta-percha is red oxid of mercury, a preparation which is much more likely to be harmful than amalgam. Don't you use gutta-percha?

Dr. Beebe: The coloring matter in red base plate gutta-percha is Armenian bole, an earth composed largely of oxid of iron, and even

if it were sulphid of mercury, we would get less mercury than from amalgam.

Dr. Johnson: Dr. Palmer struck the key-note in galvanic action, but failed to note the vital point. The galvanic action breaks up the mercury and forms oxid of mercury, which is a soluble salt and a powerful poison. When the fillings are near each other in the mouth the effect is greater and more apt to affect the patient. I am not a crank on this subject, in fact, I have amalgam fillings in my own mouth, but I have had patients who suffered from their presence, also those who suffered from the wearing of red rubber plates. Some reported cases are hard to credit, such as the cure of a long-standing neuralgia in an hour by the removal of amalgam fillings. To report such a case lays the man open to the suspicion of being a crank, and brings up the idea of suggestive therapeutics, but in the other cases the idea of cure by suggestion was not admissible.

Dr. Haydon: A lady of forty-five came to my office. She was under electro-magnetic treatment and had all the amalgam fillings removed to relieve her of a ringing in the ears, but it did not improve after their removal.

Dr. H. L. Belcher, Buffalo: A friend of mine had a metallic taste in his mouth which was caused by galvanic action between two gold fillings.

Dr. W. W. Belcher, Rochester: If the keynote of the situation is as Dr. Johnson states, that the soluble salt of mercury is released by galvanic action, it would eliminate all fear of danger when there were only amalgam fillings in the mouth. Some people have idiosyncracies, and may be acted upon unfavorably by substances perfectly harmless to the vast majority of mankind. Some cannot eat strawberries, and I know a lady who is made violently ill if she eats the least bit of an apple, although she is exceedingly fond of them. Such persons would have only to look at amalgam to suffer from mercurial poisonings, and the removal of amalgam fillings from their mouths would probably cure them of almost anything.

Dr. G. Goode, Rochester: Mercury in alloys is in a chemical combination and not readily separable. Dr. Black taught us that the change of form in amalgam fillings, always thought to be due to oxidation, was due to flow of the amalgam or what is commonly called "stress." The amalgam is possibly changed by changing the chem-

ical composition of the filling, and this change may drive the mercury to the side of the filling and thus allow of its escape.

Dr. Beebe: Amalgams, as any alloys made by a mixture of two or more metals in definite proportions, are mechanical combinations, but all amalgams are not alike, therefore galvanic action would be produced in a mouth having only amalgam fillings.

Dr. C. H. Nicholson, Rochester: I do not believe amalgam is a chemical compound, but simply a mechanical mixture, and mercury may be freed from it under certain conditions. That galvanic action may change mercury from the metallic state to a salt may be granted, but I do not believe it can be demonstrated, and if it does so, the amount of mercury so thrown into the system would not be sufficient to affect it. Those brought up in the homeopathic school no doubt think so, but the idiosyncrasy of the patient would explain any supposed effect in perhaps every case. I believe in the effect of suggestive therapeutics. A young man came to me with severe neuralgic pains in the side of his face, which he supposed were from a tooth he pointed out, which had an amalgam filling. This filling was removed, but the tooth was found to be in good condition, and the cavity was filled with gutta-percha. The neuralgia left him for a time, but after a few weeks he returned with the same trouble, and this time he thought it was from the next tooth. This was opened up and found to contain a pulp stone. A cure of the neuralgia followed as before, but twice more it returned, and the last time I only pretended to do something to the tooth and discharged the patient. Some time afterwards a hypnotist was giving an exposition, and this same patient was made the subject and proved to be very easily brought under hypnotic influence. At the end of the seance he suddenly had a severe attack of the neuralgia and called to me for help. I told the hypnotist that the man had no toothache or other pain, but thought he had, and asked him to treat him by suggestion. He was thrown into a hypnotic sleep and told that the trouble and pain had left him, and when he awoke he was all right.

Amalgam has been used more than any other filling material, and with most excellent results in saving the teeth and building up the health of the patients, and unless there is a rare case where we know there is an idiosyncrasy against it we should not hesitate to use it.

Dr. M. Rosenberg (M. D.): I do not believe that mercury could produce any poisonous effect in quantities so infinitesimal as would

be derived from amalgam fillings in the mouth. I frequently prescribe mercury and never get the results from much larger doses than are described in these cases. The human system will withstand the action of poisons and eliminate them when in small quantities. The galvanic current theoretically will produce chemical changes, but the current must be used in definite amounts, and that generated in the mouth would be too slight to produce appreciable results.

Dr. I. C. Edington, Rochester: There is one phase of the subject that has not been considered. I had a patient who complained of neuralgia and metallic taste in her mouth from the effect of amalgam fillings. I replaced these with gold fillings and gold crowns. Some months later she returned, complaining again of the metallic taste, and suggesting that pure gold had not been used. I consulted Dr. Palmer and he said galvanic action was possible between different qualities of gold. She had two or three 22K. gold crowns, soldered with somewhat lower carat, and the fillings were of course pure gold. I concluded nothing could be done, and the metallic taste continued, though it was not as bad as it was when the amalgam was present.

AN OVERCROWDED PROFESSION would not be the burden of professional complaint if the people were taught to employ medical counsel earlier, oftener, and to retain it longer, as they should, before people have to be sent to bed by illness. Twice as many physicians are needed by the people as are employed. In times when epidemics are pending or approaching the people should be put in organic and functional condition for meeting and successfully combating disease. It is now the custom to wait till the human machine is broken and prostrate before asking medical counsel and aid.—*Alienist and Neurologist.*—How about this for dentistry? ED.

CONGENITAL CYSTS OF TONGUE.—John Ward Cousins states that congenital cysts of the tongue are not a common class of tumors. They generally occur in the middle line between the genio-hyo-glossus muscles, or between the genio-hyo-glossus and the mylo-hyoid. Sometimes they remain unchanged for many years. Their contents consist of soft sebaceous matter, and occasionally they contain also hair and solid masses of true dental tissue. The cyst wall is lined with squamous epithelium, and is of delicate structure and easily torn, but it is occasionally thick and fibrous. These tumors do not fluctuate, but feel elastic and tense on palpation. They are generally observed in young adults, and their existence is often overlooked during infancy and early life. They are painless and increase with the development of the individual. Irritation is apt to develop inflammatory changes in them. Congenital cysts have their origin in the accidental displacement of some epithelial structure.—*Brit. Med. Jour.*

Digests.

HYGIENE OF BRIDGEWORK AS EXEMPLIFIED BY A PIECE OF REMOVABLE PORCELAIN BRIDGE. By Joseph Head, M.D., D.D.S., Philadelphia. Read before the New York State Dental Society, May 15, 1902. The frequency of gum infection, and the ease with which this infection results in pyorrhea alveolaris, have long taught the thoughtful dentist that all dental substitutes must be constructed primarily so that they can be kept scrupulously clean. Much has been written of men who lived to a good old age and who never saw a tooth-brush or heard of a mouth-wash. Such people have existed and do exist; also, strong and healthy people have lived for years covered with vermin, and still live. These latter no doubt think the conventional man overfastidious, but in spite of such sneers cultured men will never again willingly harbor fleas, and the time is surely coming when it will be considered equally revolting for a mouth to swarm with the microorganisms of putrescence and disease.

Dentists are those by whom this reformation is to be secured, and therefore they should be the last to increase the contamination in the mouths of their patients through filth-collecting appliances. Many a dentist, when cleansing a set of teeth covered with putrescent tartar, has wished that he could take those teeth from the mouth, scrape them, boil them in some antiseptic, polish them on the lathe and put them back into their original sockets. He knows in his heart of hearts that that is the only method by which he can be absolutely sure of making such teeth perfectly clean and the gums free from infection. But as this is not feasible, through three or four sittings, with the necessity for his greatest care and skill, he scrapes and sterilizes, almost as well as he could do in a few moments if the teeth were out of the mouth.

The perfect cleansing of infected gums and teeth is now recognized as one of the most difficult operations that the dentist has to perform. Perfect cleansing of the teeth is a task that the average patient cannot do for himself without professional assistance. Yet in spite of all this difficulty in cleansing the natural teeth, each year hundreds of dental appliances are inserted, so constructed that even dental assistance cannot keep them wholesome and clean. Unless a dental appliance can be kept at least as clean as the teeth could be

without it, it has no excuse for existence. Mouths at best are none too clean. He who places a filth-collecting appliance, no matter how beautiful it may appear, has injured when he claims to have benefitted. These truths are so self-evident as to be elementary, and I would ask pardon for accentuating them, did I not hope to use them as axioms to illustrate why, all other things being equal, removable is to be preferred to stationary bridgework.

If, as is evident, the natural teeth could be more perfectly cleansed out of the mouth, it needs no argument to prove that the removable bridgework of itself is preferable to stationary bridgework, for the former can be made cleaner than the teeth, while the latter at best can be made only as clean. All stationary or saddle bridgework

FIG. 1.

FIG. 2.

should be so constructed that each day floss silk can be passed between every part of the structure and the gum on which it rests. And this, as I shall presently demonstrate, is quite possible even where the closest apposition is obtained between the structure and the gum, providing the appliance be made to touch the tissues on a curve approximating a straight line, as in Fig. 1. If, as in Fig. 2, the gum contact has a sharp curve, the passage of a thread will be difficult or impossible. The saddle bridge is in many instances so much more satisfactory than the removable bridge that it will always have its advocates if it is constructed so that the bacteria and products of fermentation can be removed each day from the gum line. Under these conditions its use is perfectly defensible, but if such hygienic provision be not made such an appliance is contrary to the modern science of bacteriology and hygiene. The advocates of the ordinary saddle bridge claim that if it be made to press firmly upon the gum, such close apposition is obtained that food collections do not occur. They say that on removing such an appliance after years of use a slight reddening or superficial stasis of the gum tissue alone will be found.

But even this superficial stasis is a serious menace. What causes it, this reddening, this exfoliation of epithelial cells? It does not oc-

cur under removable bridgework, where daily cleansing and sterilization are performed. Clean, well-fitting metal or porcelain would never cause it. The superficial stasis can arise only from bacterial infection, and such infection is a menace to the peridental membrane of the teeth to which the structure is attached. No joint of gum and metal, however close, can hope to exclude the bacteria, and while mucin is secreted by the gum such bacteria will never lack nourishment, even though the ordinary food in mastication may possibly not enter. Even, for the sake of argument, if such a tight joint were obtained between the structure and the gum as to exclude bacteria, this tight joint could not exist where the bridge joined the neck of the tooth. For here we have the free margin of the gum which cannot be cleansed, and also there is the movement of the tooth in the socket which must allow liquid proteids to enter, thus furnishing food for the germs of fermentation and putrefaction. These, in their turn, are most likely to cause peridental infection—the greatest possible danger that can threaten the welfare of the teeth.

Hence we must conclude that the use of the saddle bridge so constructed as to be incapable of being cleansed is unwarranted. It is true that some affirm these same bridges have been used with satisfaction for years, and plead that this should count for something in their favor, but it must be remembered that what may be tolerated in one mouth may not be in another. Some mouths breed dangerous infections while others do not, and we can usually be sure that a filth-collecting bridge will be safely tolerated by the tissues only after we have seen it proved. We have no right to subject our patient's mouth to the risk of infection because a certain limited percentage of mouths can withstand infection without serious consequences. Whenever a stationary bridge is placed the mouth should first be carefully examined to see how much care the patient should take to keep the teeth generally clean. Mouths, as before stated, vary in this respect. Some will collect large quantities of infectious tartar in a week, while others will remain comparatively clean, with half the care, for months at a time. Thus the individuality of the patient should be studied; mouth washes should be prescribed, and he should be told just how often his teeth need to be polished, and how often the brush, floss silk and mouth-wash should be used. Patients as a rule are grateful for such instruction, and will readily appreciate its importance. When by thorough treatment the mouth has been freed from

infections, two kinds of stationary bridges may be employed. First: The bridge fastened only on one side and supported by a pin resting on the sulcus of the tooth on the other side, thus allowing free movement of the tooth and bridge, and also allowing the passage of floss silk under the pin down between the bridge and the gum tissues. Second: A bridge fastened on both sides, which has the advantage of greater stability, but possesses the great disadvantage of preventing the natural movement of the teeth.

The bridge fastened on one side and supported on the other may be constructed as follows (see Fig. 3): A represents a crown, B represents the dummy or bridge, C represents a pin from the bridge resting on the sulcus of the bicuspid, under which, as before stated,

FIG. 3.

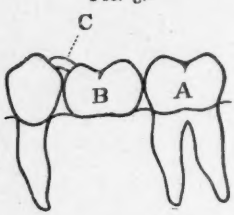
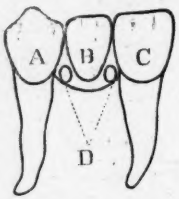


FIG. 4.



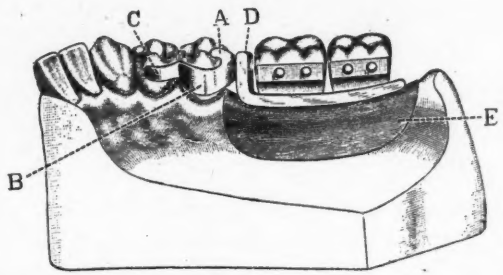
a piece of floss silk can be slipped and passed along the gum even to the crown, A. Where a single space is to be spanned, and the abutments are firm, this is a most valuable bridge, as it has ample stability and can be cleansed as thoroughly and easily as an ordinary crown.

If, however, greater stability is needed, and the bridge has to be fastened at either side, as is frequently necessary with the anterior teeth, the following device can be used for cleansing the underlying gum: Fig. 4 represents a lateral incisor bridge; A is the cuspid crown, C the central incisor crown, B the lateral incisor dummy resting snugly on the gum; D represents two small grooves going under the bridge between the necks of the crowns and the lateral incisor dummy. Through these holes floss silk can be passed, and the bridge and necks of the teeth be easily cleaned each day. These holes, while invisible to the observer, allow free passage of the mouth-wash, which, when properly used, can keep the necks of the teeth as free from bacterial deposits as though the bridge were not present.

The movable porcelain bridges that are responsible for this long

preamble on bridgework will now be considered. The first, intended to replace lost molars where support from the teeth is possible on one side only, is constructed as follows (see Fig. 5): As observed, the teeth back of the second bicuspid are missing. A gold clasp, B, No. 22 gauge, is fitted to the second bicuspid; to the ends of the clasp gold spurs, C, which half embrace the first bicuspid near the gum line, are fitted and soldered. Then a piece of pure gold, gauge No. 36, is soldered to the clasp at the posterior aspect of the second bicuspid and burnished into the occlusal groove. When this is stiffened with gold and solder it will form a spud that will prevent

FIG. 5.



the clasp from being driven into the gum by the force of mastication. The clasp and spud should now be polished to the lines desired, and a thin coating of borax flowed over them so as to expedite future soldering. They should be then placed upon the model and a right-angle piece of No. 14 platinum-iridium wire should be adjusted to it and to the gum line, as in Fig. 5, D. Then platinum foil one one-thousandth of an inch, E, should be burnished on the ridge to fit the model. The angle wire should be placed in position on it; continuous gum body should be placed on the angle wire and platinum foil, and rubber teeth of the proper size and shade should be placed upon the body just as if it were the preparation of a rubber case. When the body has been carved to the proper lines of the gum the platinum foil, the angle bar, the teeth and body should all be removed together, placed in the oven, and given a thorough glaze. When the porcelain is cool the platinum foil should be stripped off, new foil should be burnished to the model, new continuous gum placed on the foil and the porcelain pressed down hard upon it to a point where the articulation is a little high. This excess of articulation is necessary in order

that perfect occlusion may be obtained when the case is finally fitted in the mouth, and the second portion of body is necessary to make up for the contraction caused by the fusing of the porcelain piece in the first bake. When the porcelain has been carved a second time to a satisfactory line it is removed again on the platinum foil and placed in the oven and baked once more. After baking and after the platinum foil is removed the porcelain block should accurately fit the model. If gum enamel be necessary there will have to be a third baking, but for this no platinum foil will be needed to preserve the contour, as the continuous gum body fuses at a higher point than the enamel. Fig. 6 shows the finished piece. When the porcelain block is finished we have a gold double clasp with spud, and a porcelain

FIG. 6.

FIG. 7.

block with a platinum bar running through it. It now remains to join them together. The clasp is placed in position on the model; the end of the porcelain block that goes next to the clasp should be ground until the platinum is clean and fresh enough to receive the solder. Then to the end of the ground porcelain a thin backing of pure gold should be burnished to make a tight joint with the porcelain, and the middle of this backing should be torn so as to expose the platinum and make a union of solder with the clasp and gold backing and platinum bar easy. The clasp and block should then be placed in position and soldered in the usual way. It might be well to state that coating the gum enamel with shellac varnish prevents any of the investment from sticking to it during the process of soldering.

The other bridge I wish to speak of is for a space where a single molar or bicuspid is missing, with a tooth on either side sufficiently strong for an abutment. It is made of porcelain attached to platinum clasps as follows (see Fig. 7): A represents iridio-platinum clasps of No. 14 gauge wire made to encircle the molar and bicuspid. A U-shaped piece, B, of the same wire is soldered to the clasps so as to rest on the grinding surfaces of the molar and bicuspids and also conform somewhat to the gum line. As in the other case, platinum

foil is burnished to fit the model in between the teeth. The clasps and connecting platinum U are placed in position, continuous gum body is placed on the platinum and wire, and a rubber tooth is adjusted as in the other case. Two bakings with platinum foil are required and one for the gum enamel, which finish the appliance, as no further soldering is required. It might be well to state that

FIG. 8.

platinum solder is of necessity used in the construction of the framework that holds the clasps in position. Fig. 8 shows the finished piece.

These devices are not theoretical, they are practical—are in fact being worn by many patients at this moment. They have the great advantage of cleanliness and stability; and their use does not necessitate the laceration or removing of the enamel from the teeth that serve as abutments. These spuds prevent motion under mastication and so avoid wear and cutting of the supporting teeth, and if the patient is properly instructed, such appliances can ordinarily be worn for years with comfort and safety.—*Cosmos.*

FUNCTION: ITS INFLUENCE ON STRUCTURE. By C. N. Peirce, D.D.S., Philadelphia. Read before the Boston and Tufts Dental Alumni Association, April 9, 1902. That tissues are made of cells of original or altered shape, separate or confluent, is well known. That the arrangement of tissues into organs is due to the multiplication and direction of cells is also evident. In the higher organisms we have muscle converting the results of nutrition into muscle; skin making more skin; brain making more brain; bone making more bone, etc., etc. In all this reproduction of structures we should appreciate the fact that the more perfect is but a modification or transformation of the less perfect. But in this whole plan of creation we must accept all changes as an endless succession of cause and sequence, influencing all matter animate or inanimate. While the foregoing has but an indirect influence upon the theory of use and disuse modifying structures, yet it does point to the condition

which the following paper will attempt to emphasize, namely, that organs and organisms are but a modification of something that has preceded them.

Influence of Use and Disuse Upon Tissues.—So difficult is it to reach the exact truth regarding any proposition on the more or less permanent and transmitted alterations in the structure of organs and animal forms, that one feels much disposed to hold his judgment as suggested by your late townsman, John Fisk, "in readiness for revision." The effect of use and disuse on structures is, however, so manifestly persistent that conclusions are drawn without much hesitation, and it is only when the query as to limitations is made that the possible recognition of other forces may step in and say—thus far shalt thou go. Most of those who have been considering the factors in evolution since the days of Lamarck (1744-1829) place great importance upon the effects of disuse in the atrophy of organs, and give many illustrations of its influence, such as the weakening of the muscles of the ears in domesticated animals and in man; the abortive eyes of moles, certain rodents and cave fishes; also the lighter wing bones of domesticated ducks and other fowl; the reduced size of the little toe in man; the reduction of the toes in the horse; and we might add the appendix vermiformis in man. Illustrations may be cited almost without limit, resulting from disuse or absence of function. On the other hand, instances quite as numerous may be given showing that function or use has a marked influence in not only facilitating development, but oftentimes in increasing the size of the organ and the efficiency of the animal possessing it. A few of these that are familiar to you all may be cited, such as the leg-bones of the varieties of the fowl; the udders of the cow and the goat; the powerful limbs of the heavy draught horse, as well as the delicate structure of the racer; the efficiency of the toes of man born without arms, and also the toes of the men and women of Panama, who fish for oysters in the ocean when the tide is running in and the water in which they are standing is to their armpits; the dermal surface of the hydra adapted to its environment without reference to which side is out; the beak of the shoveler duck; the baleen plates in the mouth of the balenoid or great whale; the muscle of the blacksmith's arm in response to its forging; the increasing size of the great toe from carrying the weight of the body; the thickness of the epidermal tissues in the palms of the hands and

the soles of the feet; the growth of corns; these latter may come from friction, pressure or strain, but they are nevertheless subject to influences which may properly be termed use.

That the flow of blood is increased towards organs or structures performing work is a very natural assumption, and that parts not used or exercised would proportionately be deprived of that nutritive fluid is certainly a sane conclusion. Frequently recurring efforts then would simultaneously supply the tissue with more blood and hence better nourishment, so that as an inevitable result the size must be increased, and by transmission succeeding generations be naturally influenced, while with the reverse, the absence of nourishment must result in vessels of diminished size and less pronounced tissue.

It is then quite true that evidences of not only progressive development, but of reversion, retrogression, atavism, if you please, can be cited almost without limit.

Mutilations Not Transmitted.—Before attempting to utilize these statements as anticipated, a word must be added about mutilations. With this theory of the influence of use and disuse upon structures, efforts have been made to associate the idea that mutilations should also be so intimately connected as to modify any statement made regarding the transmission of an atrophied or an enlarged structure. The facts, however, disprove the transmission of mutilated organs. Frequently the experiment has been made, but always with the same result. Structural alterations resulting from mutilations are not transmitted.

Influences of Environment.—In all animal structures we have two alternative propositions expressive of their uses. *Either the necessity for and attempt to use preceded the adaptive structure, or the structure preceded and gave origin to the desire for use.* The facts at our command certainly make the first proposition much the more probable of the two. The structures of living beings are either adaptive or non-adaptive; they are either in anticipation, fitted to meet the peculiarities of their environment, or they are not. It is an almost everyday experience that changes in environment occur without warning or preparation for them on the part of living things. If changes are very great the animal may succumb, but usually the elasticity of life is such that the influence of the environment is tolerated, and the special adaptations must follow, and not precede, conditions of climate, location, population, food, etc., etc. In connec-

tion with this we have the other important consideration, nutritive material must be called to affected localities to sustain the change, whether the tissue involved be muscular or otherwise. One of the direct evidences which we have in support of the view that motion affects structure directly is that organs are increased in size and power by use. This increase is of course limited by the fixity of all the organs, so that one cannot be increased to the detriment of the others in use. Illustrations of this are not necessary, beyond stating that the limitations of each organ must be subservient to the possibilities of congenital structure. Especially is it desirable now to direct your attention to the query, "Are the hard and most dense structures, such as the tissues of the teeth, subjected to the same influences as the more vascular, and if so, do they respond as certainly to use and disuse, or impressions of friction, pressure and strain?" This is assuredly an inquiry in which dentists are certainly largely interested, and in the answer the whole scope of what we term operative dentistry is involved.

A simple and not infrequent condition, with which you are all familiar, is the firm union which takes place between the cement of the root of the tooth and the process forming the socket, probably most frequently located in the mouth of the seamstress, who has been accustomed to biting off threads with the convenient but much abused cuspid. Molars and bicuspids are, however, liable to the same anchlyosed condition between process and cement where the teeth on the opposite side of the mouth have been prematurely lost, or where the individual has been in the habit of using one side of the mouth exclusively in the mastication of food. The superior third molars, when crowded, are also from the strain, which is continuous, similarly attached to the process.

Reference to some of the simplest vertebrate teeth illustrate this influence perfectly. In the little dogfish but recently hatched you will find the external surface carried over the jaw utilizing the spines (placoid scales) but slightly modified, while under the influence of subsequent function they increase in size and density. Arising from the integument may be added also the almost endless variety of teeth found in the class *Pisces,* or fish tribe, these offering in every particular a most remarkable differentiation as regards size, structure, attachment and density. The teeth of the shark are but modified spines, their size and structure corresponding with location and func-

tion, the latter being the adaptive agent. Animals such as the dolphin, using their almost numberless teeth only as prehensile organs, simple cones on the maxillary, with size and shape so nearly uniform, may well be termed homodonts. Though simple cones, they are not less adapted by their use or function.

By this time you have doubtless anticipated the trend of my thought. Most certainly what has been said would place all teeth, simple or complex, in the same line of development, and this is true without reference to their origin being from the epiblastic or hypoblastic membrane or layer. In this then the teeth of the following classes must be included: Marsupial, Cetacea, Insectivora, Rodentia, Cheiroptera, Carnivora, Proboscidia, Articulata, Perisodactyla, Lemurs and Primates. Use or functional influence, exerted, must specialize, and render them most efficient in serving the needs of the animal, as preassimilative organs, and that without reference to the animal being terrestrial, arboreal or aquatic.

This much has been said, you will think, rather dogmatically; to modify the statement a few additional illustrations may be pertinent. The nine-banded armadillo examined from the side of the crania beautifully displays the absence of enamel on the teeth; that this condition has been reached by a process of retrogression or degradation seems to be fully established. Charles S. Tomes has demonstrated that the tooth germs of this armadillo have distinct enamel organs, which are subsequently aborted as the tooth comes to maturity. This discovery Mr. Jacob L. Wortman, in his article on comparative anatomy of the teeth in the "American System of Dentistry," says "is important, since it indicates pretty clearly that the loss of enamel is a mark of degeneracy, and leads indirectly to the conclusion that the armadillos at least are descended from ancestors with enamel covered teeth, who in all probability were the possessors of a completely developed permanent set." The only assignable cause for this degenerate condition—the absence of enamel—is the jaw movement and food habit, this group of animals having a long tongue covered with a viscid secretion for the capture of insects which constitute their food, the same being swallowed with little or no mastication.

Another conspicuous illustration is found in those animals having the antero-posterior movements of the lower jaw. The molars of the muskrat, of the capybara and of the India elephant, representatives of

widely different animals, are so similar in the transverse arrangement of the enamel infoldings, and in their efficiency in the trituration of food, as the jaw is moved front and back, that we cannot overlook their pertinency at this time.

The extinct horse, the modern horse and the rhinoceros each has quite the same mandibular movements and jaw excursions, hence the same triturating ability must correspond with the enamel infoldings, which are not, as in the previous case, arranged in a transverse manner, but at various angles, so as to render the most efficient service. The molars of the carnivora, as well as the incisors of the rodentia, are not less conspicuous illustrations of the specialization of structures than those which we have enumerated.

You may very appropriately make the inquiry as to the ancestral influence in the illustrations given. It is doubtless an important factor, but it nevertheless does not detract from the influence of the original habit, which has established the dental structures which have been so persistently transmitted.

Cusp Addition and Cusp Concrescence.—Again the inquiry may arise: Are these isolated cases? to which the response shall be, that all animals with a specialized food habit display the same peculiar correspondence between jaw movement and adaptation of tooth structure which renders the most efficient service in the trituration of food. Assuming the foregoing to be a correct exposition of dental evolution, adaptation and function, the origin and development of the *human* molar follows, its evolution being emphasized through "cusp addition" rather than the theory of "cusp concrescence," though the latter has been so strongly urged by some German odontologists (Professor Schnable, Dr. Carl Rösa, Professor Kükenthal).

These two terms are thus placed that some short explanation may make clear their significance. The former, cusp addition, is formed by the addition or rather by the projections of immature cusps to the sides of a primitive single cone tooth, such as is found in the dolphin or toothed whales, while the concrescence theory necessitates a combination of these simple conical forms being cemented together, the tip of the cone constituting the foundation for the future cusp. In order that this theory should be sustained, all mammals possessing compound or complex teeth must at some early period have had a very much larger number of teeth, but all of quite a simple conical form, and these must have been grouped together in order that the

tritubercular, the quadritubercular or the multitubercular crown might be formed. In order to complete the adaptation, essential to normal occlusion, the exercise of their function would certainly have to be brought into requisition, and even then much friction and strain would be required in order to reduce the triturating surface to a satisfactory working condition. A very serious obstacle to this theory, however, is the source of the essential force that is to bring the cusps or points of these individual teeth into variable groups according to the more or less complex patterns of the prospective crowns. Enough now of this concrescent theory has been said to make you familiar with the processes involved.

In reference to the cusp addition theory, certainly every observing practicing dentist has noted projections from the crowns of permanent teeth resembling immature cusps, and these are not always confined to the crowns of molars; incisors and cuspids have shared in these projections sufficiently often to indicate the part they have probably taken in tooth evolution.

One more illustration in favor of this cusp addition theory. Every one who is at all familiar with the lower molars and their fifth cusp will give evidence of its location between the lingual and buccal distal cusps. Never does it make its appearance on the anterior or mesial part of the crown, but always on the distal, and the third molar, which in so many mouths is in a degenerate condition, is very rarely in civilized life more than a quadritubercular crown.

Those of you who have given little thought to this method of tooth development will doubtless think that it requires some exercise of the imagination to see new additions to what was originally a single, simple, and more or less conical tooth. But you must appreciate the fact that Nature does not work rapidly in the modification of structures, and the language of Lamarck indicating this is certainly wise and pertinent. He says: "The production of a new organ in an animal body results from the supervention of a new want continuing to make itself felt, and a new movement to which this want gives birth and encouragement, * * * and that the development of organs and their force of action are constantly in ratio to the employment of these organs."

Imagine these minute projections and ridges actually present, and in the succession of generations see them increasing in size and adapting themselves to the service of the animal through the influence

of the friction or impact of the food habit, and you will see a condition that was most certainly an early effort at tooth formation and at a time when much that is now was immature.

A word regarding embryology, as a factor in elucidating this subject. You are all familiar with the enamel organ and how it is formed, also with the origin of the dental papilla; both of these germs, if the eye does not deceive one, are but a single diversion or projection from the parent membrane. That calcification beginning at several points cannot be regarded as any evidence that either is a compound structure. So the evidence we get from embryology but sustains the proposition that the simple, single, cone-shaped tooth is the parent of the multitubercular crown.

From the previous pages you infer that the teeth in their development, like the more vascular tissues, are dependent upon function and inheritance for their morphology, structural arrangement, density and size. In the exercise of those factors should be placed as of first importance, jaw movement, or the mechanical force involved in these mandibular excursions. This force must of necessity vary with the food and the difference in the degree of resistance it offers in its comminution. Following this would come that most important evolutionary factor, heredity. The formative influence of function is seen in the teeth of the Gasteropoda, where variety in shape is a constant concomitant of variety in food. It is in evidence in the Mysticete or Balaenoidea, where the great plates are so well adapted to securing low forms of life in the sea. The sharp, cone-shaped teeth of the Denticete, so well adapted to seizing live prey upon which the sperm-whale lives, illustrate it. Also in the molars of the Herbivora, where the infolding of the enamel, with less dense structures, always presents sharp surfaces for the cutting of dry and coarse vegetation. And in the molars of the Proboscidia and Rodentia, where the transverse enamel layers are so efficient in the trituration of food. The trenchant-shaped molars of the carnivora illustrate it in their lacerating capacity, the edentata also in the abortive enamel from the tooth crowns. It is seen in the teeth of children where the triturating or comminution function is delegated to the stomach, and in the third molar of man, where it is variable, in time of eruption, in size, structure, shape and durability, from the absence of function, in the modification of diet, and the shortening

of the lower jaw with growth of civilization and increased intensity of the nervous system.

Conclusions.—In conclusion, let me repeat here the following postulates, some of which I have previously used and published—*First:* That the tendency is to the suppression of organs and tissues not used, and the development of those most used. *Second:* That the teeth, notwithstanding their density, are, like the more vascular tissues, subject to modification from use and disuse. *Third:* That the food habit and cumulative results of heredity have been important factors in shaping tooth forms. *Fourth:* That the degree in which teeth are modified from a simple type is in correspondence with the differences in the degree of resistance to be overcome in the mastication of food. *Fifth:* That the restriction and limitation of diet has contributed to the specialization of the teeth. *Sixth:* That the varied and omnivorous diet of the human family and the disuse of their teeth have retarded the specialization of these organs and encouraged dental decay. *Seventh:* That an invariable result of the effort of specialization is a reduction in the number of teeth. *Eighth:* That in the trituration of food there is a constant effort to establish such excursions or mandibular movements as will be most efficient in this preassimilative process. *Ninth:* That the mandibular movements in the effort of mastication must largely control the specialized condition of the teeth, the glenoid plates and the condyles.—*Items.*

BLEACHING TEETH. By N. S. Hoff, D.D.S., Ann Arbor, Mich. Read before the Tri-State Meeting at Indianapolis. The subject of decolorizing teeth stained by what may be termed the natural or consequent causes of accident or carious destruction of the teeth is well discussed in our text-books and by casual writers on the subject, but the removal of stains produced by chemical agents used in the antiseptic treatment of necrotic pulps and alveolar abscesses is not clearly set forth in any text-book, nor has it been well brought out in the discussions of this subject in dental societies or literature. Probably the reason for this is that little attention has been given to differentiating specific methods designed to decolor this class of stains; or dentists are becoming more careful in the use of such antiseptics as are liable to produce this class of discolorations. It is, however, true that the most efficient antiseptics are those substances which tend to produce color change in tooth struc-

tures when used in certain classes of teeth, or when their use is long continued.

For our present purpose it may only be necessary to state that teeth with thin, transparent enamel show this kind of pigmentation by contrast more pronouncedly than those do which have more substance and less pronounced refractive qualities. Structurally some teeth respond more readily to this class of color-making reagents than others. The age of the tooth and its physical integrity are sufficiently important factors to be seriously considered when making applications of colorizing medicines in the treatment of teeth which are exposed to view. This is, however, a subject of itself—important, but too long to discuss in this paper, although it has much to do with the matter here presented for consideration.

One need not confine his observations to his own practice to realize that many otherwise beautiful dentures have been seriously marred because a prominent tooth has changed color, and it seems that no adequate effort is being made either to prevent or correct this condition. A prominent dentist, to whom we remarked that we were much interested in bleaching such teeth, said that he had not had occasion to bleach a tooth for years. It may be that some of us are becoming accustomed to variegated teeth, and are losing our sense of the truly esthetic. However this may be, we have encountered these distasteful conditions with such frequency, and have experienced such difficulties in overcoming them, that we have felt this was a very proper subject for consideration.

The remedies generally employed in antiseptic treatment, and which leave such undesirable results, are the essential oils, eucalyptus, cloves, cassia, wintergreen and others; carbolic acid, creasote, iodin compounds, hydronaphthol, tannic acid and other similar drugs used in canal treatment.

In considering the methods employed to decolor teeth stained by such drugs it will be difficult to dissociate them from other accidental agencies which are liable to be associated, and which may materially modify the treatment used. To secure effective results in the shortest time it is important that we first determine the cause of the stain and its character. This will influence the selection of the bleaching agent or process, but when a tooth is deeply stained and the condition is of long standing the problem becomes complex

indeed. If the stain is of recent occurrence and the cause be known, a proper chemical reagent may promptly effect the desired decoloration. In old stains the drug which caused the discoloration may long since have suffered decomposition, though its effects are still present, and perhaps in an unintelligible form demanding the most penetrating and destructive pigment solvents practicable.

In ordinary bleaching of teeth chemical reagents are employed on two principles. One is the removal of the pigmented structure by oxidation, the other decomposing it chemically and structurally by the process of reduction. It is questionable whether both methods may not be essentially oxidation processes; they certainly act so in bleaching organic stains. In both processes mechanical and physical detergent aids are also essential to complete results. Of bleaching agents, direct oxidizers are such as contain oxygen in loose combination which can be set free without injury to the tooth, and at pleasure. The peroxids are illustrations of this class. The reduction reagents are such as have the property of breaking up pigment compounds by chemical combinations or interchange of elements having stronger mutual affinities than those which prevail in the pigment compounds or the bleaching agent itself. The chlorin and sulfurous oxid methods are good illustrations, although in many cases these agents are supposed to act as indirect oxidizers.

The question which we propose you shall consider is, which of these processes and agents are of the most value, and of practical application in decoloring teeth stained by the class of drugs above mentioned? It may be of advantage to study this subject from its theoretical aspect, but should we attempt to do so we are likely to become disheartened, as the problem becomes so complicated that it is practically incapable of complete solution. The exact chemical nature of many of these substances used as antiseptics is not known, or if known is of such a complicated nature that it is difficult to determine what the reactions may be which take place when they are brought in contact with the tooth structure in its normal condition. It is still more difficult to determine the nature of possible reactions when there is present in the tooth structure the chemical detritus resulting from the necrotic processes. Notwithstanding these difficulties, successful methods of bleaching teeth will never be made practicable until some definite theoretical knowledge is

obtained. This may be secured by laboratory research, but if it be not an actual deduction from successful clinical experience, it must necessarily be so confirmed.

In order that we may secure some basis for starting an investigation of this subject, we submit a brief study which may be of some value. That a comparative study of the powers of the well-known bleaching agents might be made, we selected a number of teeth which had been extracted for some time and were thoroughly dried. These were then cleansed of all carious substances, the apices of the roots cut off, and the pulp canal and chamber reamed out so that no pulp remnants were left. They were also thoroughly cleansed externally by mechanical means, and then with hot solutions of chlorinated soda. This left them practically clean and free from all organic contamination. They were then soaked for three days in the following solutions: Full strength solution of eucalyptol, old and dark oil of cloves, old oil of cassia, Black's "1, 2, 3" mixture and aristol, iodized phenol, carbolic acid ninety-five per cent solution; old creasote, solution of iodoform and ether, alcohol solution of beta-naphthol, and a glycerin solution of tannic acid. After removing them from the stains they were dried in the sun and by a gentle heat until all moisture had been driven off. The result was a considerable discoloration in each case, varying from old gold in one to almost a purple in another.

One of each stain was then selected and cut into eight transverse sections, beginning at the apex of the root until the crown was reached. A proof set made up of one section of each of the ten stains was reserved for comparison, and the remainder were subjected to the decolorizing powers of the following bleaching agents: twenty-five per cent peroxid of hydrogen, three per cent peroxid, sodium peroxid, benzozone, aluminum chlorid, chlorinated lime, and Kirk's sodium sulphite and boric acid mixture. These reagents are well known, with the exception of benzozone, which is a new organic compound of the peroxid class. It is benzoyl-acetyl peroxid ($C_6H_5COO_2COCH_3$), and is intended for disinfectant and antiseptic purposes. We selected it because of its being an organic peroxid. From a limited experience with it we are satisfied that it possesses valuable properties as a bleaching agent, especially of organic stains. We have classed these agents into two divisions, namely, the oxidizers and the reducers. The oxidizers will include

the four peroxids—twenty-five per cent pyrozone, three per cent hydrogen peroxid, sodium peroxid and the benzozone.

Dr. Kirk, in the "American Text-Book of Operative Dentistry," states that aluminum chlorid, as used in the Harlan process, has no bleaching properties, and that peroxid of hydrogen used in the process is the only effective agent, the aluminum chlorid serving only to set free the oxygen expeditiously. While this statement as to the reaction which occurs is undoubtedly true in the main, there is a strongly increased acid condition developed in the use of this process, which would indicate a chemical as well as a physical reaction, with the probable formation of hydrochloric acid. This acid would materially influence the bleaching process by its detergent action on both the mineral and organic stains and tissues. In our experience it seems to have had some advantage over the same strength solution of peroxid alone, and we are therefore inclined to classify it with the reduction agents.

The bleaching of the ten different stainings was under as nearly similar conditions as it was practicable to devise. Each set of sections was subjected to the several respective reagents for twenty-four hours at 60° F. Of course some of the reagents became temporarily heated while being mixed in the test-tubes. After twenty-four hours they were kept at 100° F. for one hour, and then removed from the bleaching solutions and repeatedly washed in several changes of distilled water.

They were carefully dried for several days in the sunlight and tabulated. As might have been expected, the twenty-five per cent pyrozone made the most creditable showing as a whole—bleaching all the stains satisfactorily except the iodin and creasote. These two stains were the most profound, and did not yield to the oxidizing influence of the pyrozone so well as they did to the alkaline sodium peroxid.

The sodium peroxid produced almost as satisfactory bleaching as the pyrozone; none of the specimens were as clear as some of the pyrozone, but all were very materially affected. The sulfuric acid used to liberate the oxygen in the process seems to have very materially affected the inorganic part of the sections. Such effects on the teeth in the mouth would necessarily contraindicate its use. It is unquestionably a great solvent of the organic structures.

The benzozone stood third as to effectiveness, so far as the clear-

ness of results is concerned. It produced nearly if not quite as satisfactory bleaching as the sodium peroxid, and although this agent gave a decided acid reaction while bleaching, the sections did not show any destructive acid effects. The acids in this substance are organic and weak, and consequently would not affect the inorganic tooth-tissues. This agent has the advantage over the pyrozone and sodium peroxid of not being readily soluble in water. It is soluble only to a fraction of one per cent. Consequently it does not act promptly, but continuously, so long as any undissolved benzozone is present. When a supersaturated solution is used, as was done in this case, or when the solution is made with heat, the bleaching continues afterward, though not so intensely as with the twenty-five per cent pyrozone, for a longer period than with any of the other bleachers. We found that there were traces of it in the fourth water used to wash out the bleaching agent. This quality would indicate that this particular agent has promise of being a very effective bleacher of organic stains, because it can be used with safety and the bleaching may be done more slowly than with the other peroxids, which are so easily decomposed when brought in contact with agents which manifest an unusual affinity for oxygen.

The three per cent peroxid showed comparatively slight bleaching properties, not sufficient to make it of any great value when used by this method. The aluminum chlorid did not make a very favorable showing; it was only slightly more effective than the three per cent peroxid. It produced its best work on the iodoform and the tannic acid stains. The chlorinated lime bleaching was about the same in degree as that of aluminum chlorid. It seemed to be slightly more effective in bleaching eucalyptol and iodoform stains. The sodium sulfite and boric acid mixture was the least effective of all the bleachers used. It does not seem to have any special affinity for the essential oils, creasote, or naphthol stains; the others were only moderately bleached.

It is probably true that the methods used in making these experiments do not justify the results, as they are not practicable without material modifications in practice; and it may be that some of the bleachers would be more effective if used under other conditions. Again, the staining was artificially done and may have been more profound than is likely to be met in actual practice. Nevertheless,

the conditions were similar in all respects, and the results will undoubtedly serve as a basis for judgment in selecting a bleacher for the several stains.

It certainly demonstrates one fact very significantly, which is that bleaching of this class of discolored teeth cannot be done as effectively by chemical reagents which act by decomposing the stain on the substitution theory, as it can by the oxidizing reagents or those which act at least through molecular oxygen, probably in the form of ozone, which effectively destroys the molecular integrity of the pigment or absorbs it. We have no doubt this conclusion will be supported also by clinical evidence. It certainly simplifies the question of selecting a proper method, as it in great measure eliminates all efforts to explain all bleaching processes on the theory of atomic disintegration. Should further research prove that the peroxids are especially adapted to bleaching this class of stains, it will simplify technical details. Should the pigment be most easily decomposed by an organic peroxid, benzozone may be used in such way as shall best utilize its peculiarities. Should it be a mixed or inorganic compound, the pyrozone bleacher should produce the most effective results. Should it be a pigment more soluble in the alkalies, sodium peroxid will be most satisfactory. The principle of most expeditiously utilizing the various peroxid preparations, and the devising of such methods as shall most effectively utilize all the virtues practicable of each drug or class, may be left to the ingenuity of the practitioner.

ALVEOLAR ABSCESS: ITS COMPLICATIONS AND TREATMENT. By James F. Wessels, D.D.S., Philadelphia. Read before the Pennsylvania Association of Dental Surgeons. Notwithstanding the greater success attending operations upon devitalized teeth since the necessity of aseptic precautions has been generally recognized, we are still called upon to treat cases of threatened or actual alveolar abscess. Owing to neglect or oversight on the part of the patient, extreme difficulty in utilizing known precautions in some cases, and untoward systemic conditions we are not as yet fully able to understand or control in others, it is not at all likely that alveolar abscess will in the near future cease to be a subject of interest to the dentist. It is therefore well to occasionally go over the ground, mark the progress made, and by a mutual interchange of

experience seek a better understanding of the phenomena and strive to secure better remedial results.

It is generally conceded that by far the larger number of cases of alveolar abscess are associated with a devitalized pulp; it does not usually, however, immediately follow the death of this organ. The tooth may continue comfortable for months, sometimes for years. Following the death of the pulp, after a longer or shorter interval, acute pericementitis, one of the most painful affections of the teeth, ushers in a train of symptoms, which if not checked culminates in alveolar abscess. It is well known that decomposition of the devitalized tissues leads to the formation of gases which produce pressure, irritation and congestion of the peridental membrane. The additional blood brought to the parts produces pressure upon the nerve filaments with which this sensitive membrane is so bountifully supplied, thus causing intense pain. If this congestion is not speedily relieved it will very soon terminate in suppuration and alveolar abscess.

Let us consider the symptoms of pericementitis. The tooth is somewhat more than normally sensitive to touch. There is a constant dull heavy pain; pressure, however, at first seems to give a sense of relief, but as the congestion increases and the peridental membrane thickens the tooth is raised from its position and becomes perceptibly longer, and is thus brought into occlusion before its fellows. Intense pain results, so that the patient is unable to masticate with comfort. The gum tissue over the root of the tooth is at first a little darker than usual and sensitive to pressure. This redness is later increased until the gum becomes nearly purple, and it is by this time apt to be considerably swollen and extremely sensitive. This condition usually lasts but a short time before pus begins to form, and we have an acute alveolar abscess to deal with.

When called upon to treat such a case we may at times be uncertain whether we are confronted with pulpitis or pericementitis, so it is of interest to compare the symptoms. We may remember that the peridental membrane is the organ of touch for the tooth, and that the pulp is more sensitive to thermal changes. In pulpitis the pain is often of a reflex nature and the patient is unable to locate the seat of trouble. In pericementitis the offending tooth is more readily located. In pulpitis changes of temperature, especially extreme cold, cause increased pain; while in pericementitis changes of temperature

seldom have any marked effect. Heat, however, at times, as in all inflammatory conditions, increases pain. Tapping the suspected tooth with a steel instrument is a method in general use for diagnosing a case of pericementitis; the diseased tooth, being more sensitive to touch than its fellows, usually responds. At times, however, the patient is unable to give us much help, one tooth seemingly is about as sensitive as another, and when several teeth in the immediate locality contain large fillings we are often in a quandary. I have noticed when tapping several teeth that the affected one usually gives a different sound. When this difference is evident I seldom hesitate to drill into the suspected tooth or to remove a filling.

After the offending tooth is located, attention should first be given to the pulp canal. The pulp will usually be found wholly or partially decomposed. The canal should be thoroughly cleansed, and if pus be not yet present an attempt should be made to avoid an abscess by counter-irritation, or by relieving the blood tension by lancing or leaching, and also, if necessary, by systemic treatment. A hot foot-bath just before retiring, followed by a generous dose of a saline cathartic, and another dose the next morning, will often assist to re-establish normal circulation in the diseased tissue. A dose of from six to eight grains of sulphate of quinin will often check the formation of pus. This may be followed by one-drop doses of tincture of aconite every hour until bedtime. Great care should always be used in giving aconite. I am in the habit of counting the hours between the time the patient calls and about nine o'clock p. m., and giving the patient just that many drops in a small phial with implicit directions to put the contents into as many teaspoonfuls of water as I have given drops, and to take a teaspoonful of the solution every hour as long as it lasts. If much pain is present, with high fever, a Dover's powder may be of benefit. An early resort to the above treatment will often arrest the untoward conditions and save the patient much pain.

Alveolar abscesses may be broadly divided into two classes, blind abscesses (those having no fistulous opening) and abscesses with a fistula. These may also each be subdivided into the acute and chronic forms. *Blind abscess* may be either acute or chronic. In the acute form it is simply an abscess, the pus of which has not as yet formed an outlet through the tissues to the surface. In the case of a chronic blind abscess we have a much more serious condition, and may

suspect necrosis of the alveolar process. The treatment in either case, however, is very similar. The pulp canal should be thoroughly cleansed and disinfected; after which it may be enlarged with Gates-Glidden drill, thus permitting the abscess to drain through the root of the tooth. If it does not do so, I do not hesitate to pass a broach through the apical foramen and endeavor to enter the abscess sac. The canal and sac should then be thoroughly cleansed or washed with a mild, non-irritating, but cleansing antiseptic; such as glycothymoline, etc. This may be followed by dioxogen, which will remove any pus that may still be present, as well as blood clots, etc.; it will also act as a hemostatic. I would, however, caution against using this latter agent early in the treatment, as owing to the pressure resulting from its rapid decomposition it is liable to give severe pain should much pus be present. After the abscess has been well drained dioxogen can be used with safety, and will prove of much service. As a rule I then inject a few drops of a ten per cent solution of zinc chlorid into the canal, forcing it through the foramen into the abscess; following this by a reliable antiseptic, such as Black's "1, 2, 3," Howard's mixture, campho-phenique, five per cent solution of formalin, etc., and then seal the cavity with gutta-percha. After allowing this to rest about a week I remove the dressing, and should there be no discharge at once fill the root. However, should pus be present, I treat the case the same as at the first sitting. Frequently a discharge will be noticed on the cotton dressing consisting of blood and serum, and sometimes a thin, light-colored pus. In such cases I cleanse the canal with dioxogen, again dry the root and place in a new dressing, the same as before, and dismiss the patient for a few days. Should the discharge be only serum or a little blood, I frequently cleanse the root canal with an antiseptic, and at once place in the root filling, but do not usually permanently fill the cavity for a week or two.

Should the abscess not heal after three or four treatments, more energetic measures should be adopted. It is in just such cases that amputation of the root end will be of value. When I find it necessary to resort to this, I anesthetize the gum over the root of the affected tooth, and with a lance make one cut horizontally and another vertically, meeting the first in the center; raise the little flaps formed and drill through the alveolar process to the end of the root, and thus produce an artificial fistula. When necessary a general anesthetic

may be used in this operation. Through the opening thus made the end of the root may be smoothed off or amputated. Before amputating it is best to thoroughly fill the pulp canal.

Abscess with Fistula.—When the case comes into our hands we not infrequently find that the pus has already made for itself an opening through the alveolus and the gum tissue. Usually this is through the gum on the buccal or labial side over the root of the affected tooth. Occasionally it is alongside the root, and makes its exit at the neck of the tooth, and may be mistaken at times for pyorrhea alveolaris; or again its exit may be at some point distant from the tooth. These abscesses may be of the acute or chronic form, and may require in some respects special treatment. The root canal should first be thoroughly opened and cleansed. Afterwards endeavor to force an antiseptic solution through the root and out through the fistula. I usually use for this purpose a hypodermic syringe, packing unvulcanized rubber in the tooth cavity, and through this passing the needle of the syringe to make a tight joint, so that sufficient pressure may be used to force the medicament through the root and abscess tract. After doing this successfully two or three times, I force dioxogen through. If the case is an acute one I inject a ten per cent solution of zinc chlorid, or equal parts of carbolic acid and tincture of iodin, through the tooth and fistula. I then dry the pulp canal and place in it a dressing; then, wrapping a little cotton on a smooth broach, I moisten it with oil of cloves and insert it into the fistula, allowing the end to protrude, and instruct the patient to remove it in about eight or ten hours. This keeps the abscess tract open at the surface and provides drainage, and prevents its healing first at the surface.

An abscess, especially if it is recent, usually heals after two treatments of this kind. If it does not I suspect the presence of necrosed bone, or that the end of the root is roughened, and instead of injecting zinc chlorid I use aromatic sulphuric acid, full strength, injecting this through the pulp canal and the fistulous tract. If this does not effect a cure, with a clean instrument, working through the fistula, I bur away any necrosed bone and smooth the end of the root. This, however, is not possible unless the fistula is nearly straight and near the seat of trouble. In unfavorable cases such means and instruments must be used as one's judgment suggests. There are cases where I find it impossible to inject a medicament through the root and fistula. In these, after rendering the root thoroughly aseptic, I fill at once and

continue any further treatment needed through the fistulous opening. I have found no advantage in keeping the pulp canal open for long continued treatment. During treatment I keep the fistula open by means of antiseptic gauze, or cotton moistened with oil of cloves. In some cases of chronic abscess on single-rooted teeth, if they do not heal after a reasonable time, I sometimes resort to extraction and replanting, and find it as a rule satisfactory, but do not recommend it except as a last resort. Abscesses of long standing are as a rule difficult to treat, and are not infrequently associated with necrosis. Such cases require time and patience. They need to be cleansed with a mild antiseptic two to four times a week until they show signs of healing, when once or twice a week will suffice. Overtreatment is to be avoided; give nature a chance and she will do wonders. I am persuaded that many cases of alveolar abscess are prevented from healing by too frequent treatment.

Fistulous Tracts.—It is surprising at times how pus will burrow through or between tissues. Usually it follows the line of least resistance, and gravity at times has an influence. Now and again it makes its exit far from the seat of trouble. Some time since I was consulted in a case where a young lady had long suffered from a dull heavy pain on the right side of the head and upper jaw. For two years she had been under treatment for chronic post-nasal catarrh, and her general health had been on the decline. I was led to suspect that a tooth with a devitalized pulp might have something to do with it, and on examination with an electric mouth-lamp found the right central a little off color; otherwise the tooth seemed normal. On tapping this tooth seemed no more sensitive than its fellows, but I noticed a slight difference in the sound. I cautiously drilled into it and found the pulp devitalized and decomposed. After cleansing the canal I injected into it a solution of phenol sodique, and was surprised to find that it made its exit through an opening just in front of the uvula. She told me that she had spent over two hundred dollars for treatment of catarrh, without relief. The case responded kindly to treatment, and in about two months the abscess seemed to have healed and the patient's health was very much improved.

In another case a mistake in diagnosis nearly cost the patient her life. The physician described a case he had just left, which he was treating for erysipelas with but little success. He stated that the face and neck were swollen, and the left eye nearly closed. The

patient, he said, had complained of her teeth, but he could not see anything wrong with them, except that the gums seemed swollen and congested. I suggested that the trouble might be an abscess. At his request I saw the case in consultation. I found the patient dull, with a high fever, the upper lip swollen so as to be even with the tip of the nose, and the left eye closed. The neck down to the shoulder was swollen, very much congested, and blue in color, resembling greatly a large bruise. I diagnosed an abscess at the root of the left central, and advised its removal. The tooth was very loose. Its removal was followed by the escape of about half an ounce of pus. The socket was cleansed with a solution of permanganate of potassium, ten grains to the ounce of water, and the patient directed to use the same as a mouth wash. I found on inquiry that the bowels had not been moved for five days. This in my judgment had much to do with the patient's serious condition, and I urged active measures to promptly relieve it, suggesting an injection of sweet or castor oil. The patient was only semi-conscious, with a temperature of 104, and the skin a yellowish white or putty color. This was at about ten o'clock a. m. The physician objected to the injection, saying that he thought the desired result could be accomplished by other means. I saw the patient again at four o'clock p. m.; she had less pain, otherwise the condition was unchanged; there had been no movement of the bowels. I again urged an injection, which was at once administered. At seven o'clock I visited the patient. The injection had produced the desired result, and the patient was resting quietly, with a temperature of 101½, a decided improvement. The next day the swelling was much reduced, the skin more normal in color, and the case progressing toward recovery. It was two months, however, before the patient regained her usual health. This supposed case of erysipelas was an alveolar abscess, and had not the error in diagnosis been promptly corrected and appropriate treatment energetically pursued, it would probably have proved fatal in forty-eight hours more.

Systemic conditions frequently favor the development of alveolar abscess. I have noticed this tendency in patients recovering from the grip, who have unfilled pulpless teeth. Systemic conditions often interfere with the treatment of abscesses. I recall one case treated for nearly three months without success. I noticed that the patient's health was much impaired, and suggested that she see her physician,

which she did. Within two weeks she developed typhoid fever. I did not see her again until after recovery, when I found the abscess entirely healed. Whenever I find systemic conditions interfering with my treatment of alveolar abscess, or any other lesions of the mouth that properly come within my care, I do not hesitate to administer appropriate treatment, in fact, feel it my duty to do so. I am aware that there is a difference of opinion on this point, and that some hold that in so doing a dentist oversteps his rights, and should in such cases always refer the patient to the physician. With this view I do not concur. The subject of Materia Medica and Therapeutics is included, and properly so, in the dental curriculum, and is given prominence in college and state board examinations. If dental practitioners have no right to use the knowledge so acquired and so tested when its use becomes necessary to the proper treatment of their patients, why these requirements? When the dental practitioner's competency in these branches has been tested and approved by those appointed to so do, or has been legally recognized, he acquires, in my judgment, a legal right to use this knowledge, indeed, it is his duty to do so whenever in his judgment the best interests of his patient are served by so doing. You will please understand I am referring strictly to those matters which properly come within a dentist's bailiwick; I have no reference to disorders he may detect which have no connection with legitimate dental work.—*Brief.*

ROOT FILLINGS AND THEIR RELATIVE VALUE. By Leo Greenbaum, M.D., D.D.S., Philadelphia. Read before the New York State Dental Society. Medical journals are replete with reports of cases concerning the uses of adrenalin hydrochlorid. Some of these are laudatory to a very high degree. From an extended use of the drug in the clinic of the Philadelphia Dental College I am unable to offer support to a spreading belief that this agent will supersede every known drug employed in the local arrest of hemorrhage. In such highly attenuated solutions as one in one thousand and one in five thousand it exercises appreciable contractile effects upon capillary vessels, making it a useful drug in many cases; but it does not give promise of promptly checking hemorrhage occurring around a tooth.

The acetate of eucain, although not so universally lauded as the preceding one, has received numerous indorsements as possessing

such non-irritating qualities as would enable it to outrank as a local anesthetic the eucain hydrochlorid. I procured this drug from the European manufacturer, and after faithful trial found that it possessed the same objectionable features as the former salt of eucain, *i. e.,* causing swelling of the parts into which it has been injected.

The subject of root-canal treatment is not new, but it is of vital interest to every practitioner. The severest application of modern antisepsis has been made in the treatment of pulpless teeth. Recognizing the difficulty attending the complete removal of organic tissues from root canals, and the decided liability to sudden septic changes involved in their retention, almost every known antiseptic has been introduced into pulpless teeth; and the following modes of treatment have been suggested in the hope of successfully eliminating a predisposition to septic changes after devitalization. The success attained in this direction is still far from being what we should like it to be; therefore any new suggestions should at once attract the attention of the profession and receive serious consideration.

Of all the materials which have been employed in root canal fillings at one time or another the profession seems finally to have decided in favor of gutta-percha and zinc oxychlorid. About ten years ago Dr. Callahan of Cincinnati introduced his sulphuric acid treatment, and upon careful reflection it becomes quite evident that it represents the only advance made in root-canal therapeutics in the twenty-five years ending with its presentation. Too much praise cannot be given Dr. Callahan for his method, and the ready and general acceptance accorded it bears sufficient testimony to its merit.

A few years after Dr. Callahan made known his treatment, Dr. Söderberg of Australia introduced a method of root-canal treatment comprising some new features. Recognizing the great difficulty in many cases attending the removal of pulp-filaments from attenuated and tortuous canals, Dr. Söderberg evolved the plan of removing as much devitalized tissue as he could, and placing in the canals a paste purposely compounded to so affect the remaining organic substances in the root canals that they should undergo mummification and hence present unsuitable soil for bacterial development. Dr. Söderberg's paste consists of desiccated alum, thymol, glycerol and zinc oxid. The remarkable drying power, together with the high antiseptic value

of formaldehyd, makes it a very valuable addition to Dr. Söderberg's paste. The formaldehyd has a hardening effect upon the paste itself, which is decidedly advantageous, as it insures retention in place.

More recently another method, fathered by Dr. Harlan, has been added to the list. This is known as pulp-digestion. It is the application of papain to the devitalized and gangrenous pulp.

The following experiments were made for the purpose of obtaining some idea of the relative value of these principal methods. In order to obtain a proper standard of comparison the most favorable conditions of aseptic root canals were produced by selecting normal teeth with accessible roots, two cuspids and three centrals. The pulps of these teeth were devitalized, every detail of the operation being conducted under the strictest antiseptic precautions. All instruments, the rubber dam and the hands of the operator were treated in accordance with the most modern knowledge of aseptic requirements. The clinic of the Philadelphia Dental College offered the necessary teeth for the experiments, and I had no hesitancy in justifying the act upon the basis of "means to an end."

After the pulps were devitalized the canals were filled with chloropercha and gutta-percha points and the cavity filled with zinc phosphate. After six weeks the teeth were opened under antiseptic precautions, and the contents of the canals placed in culture media. The results were negative—no evidence of bacterial growth.

The second series of experiments was conducted with teeth in which canals were treated with sulphuric acid. These cases were selected—three containing recently devitalized pulps and three putrescent pulps. The treatment was that which is generally followed, 50 per cent sulphuric acid being used, afterward neutralized with sodium bicarbonate. This was continued until it seemed that the apex had been reached. The canals were then filled with chloro-percha and gutta-percha points. After three months these teeth were removed, the canals opened, and bacteriological examinations made. There were negative results, except in one of the putrescent cases, which showed evidences of pyogenic microorganisms.

The third series of experiments involved the use of mummifying paste. Six recently devitalized pulps were selected, and the result in two cases showed the formation of pyogenic microorganisms. In one of these two cases the root-canal contents upon removal were found to be very foul. The tooth was removed owing to trouble

and the desire for examination, and it was found that the mummifying influence had not penetrated beyond one-third the length of the root canal.

The fourth series of experiments was conducted with the method of digesting the root-canal contents. In place of papain, as suggested by Dr. Harlan, the analogous substance, "caroid solvent," was substituted. The reason for this change was the greater efficiency of caroid, and the ease with which it could be used, as there was no necessity for making a paste. In six cases, immediately after devitalization and partial removal of pulp, caroid solvent was sealed in the pulp-chamber, which after twenty-four hours was opened and washed out with a solution of sodium bicarbonate and filled as in previous experiments. In six other cases containing putrescent pulp tissue a few drops of caroid solvent were introduced by means of a pipet, sealed in the cavity with temporary stopping, and after two days washed out with alkaline solution; root canals filled as before. After three months the root-canal fillings of all these twelve cases were removed and presented for bacteriological examination. Results were negative in all but one case, which showed bacterial growths. All of these experiments were conducted under the supervision of Dr. O. E. Inglis. The personal equation may therefore be eliminated and the conclusion drawn that thorough removal of root-canal contents under absolutely aseptic conditions offers the best means of preventing subsequent septic changes. Furthermore, we may conclude that we possess in the "acid method" and "pulp digestion" two means of root-canal treatment which may be employed with advantage in all cases where thorough removal is impossible; caroid solvent being preferred on account of the ease with which it can be used, its non-irritating property and its power of penetration.

A few words about this agent. Caroid is a vegetable digestive obtained by mixing the ferments of the plant *carica papaya* and the fat-splitting ferment of *Colza.* According to extensive investigations by Prof. Chittenden this substance possesses marked power to dissolve organic substances; this effect is produced in acid, alkaline or neutral solutions, and in the presence of many chemicals, antiseptics and therapeutic agents; it exerts its peculiar power at a wide range of temperature and irrespective of changing media or environments. Caroid as a solvent of dead organic tissue has recently been used quite extensively for the removal of hardened and

tenacious secretions in the naso-pharynx and also the false membrane of diphtheria. In order to supply the profession with a stable solution the manufacturers have prepared a saturated solution of caroid in a menstruum which prevents its deterioration, calling it "caroid solvent."

The laudatory articles which appeared in medical journals suggested the use of this liquid as a substitute for papoid in the treatment of root canals, and the surprising results obtained during the first series of experiments induced me to use it in a large number of cases of putrescent root canals which presented themselves in the college clinic. I have the record of eighteen cases, but will simply state that the good results obtained from the use of caroid solvent, the ease with which it can be applied, the penetrating power of this digestive upon all organic tissues present in the root canal and dentin, giving to the latter a whitened appearance as though it had been bleached, demonstrate the usefulness of this method of treating root canals.—*Cosmos.*

TO RESTORE THE CUTTING OR GRINDING SURFACES OF ABRADED TEETH WITH GOLD. By Dr. F. M. Smith, New York. Read before the New York Institute of Stomatology. First separate the tooth to be restored from those on either side of it, so that a separation equal to B. and S. gauge No. 25 is secured. If only one tooth is to be restored, grind off sufficiently from the cutting edge to accommodate whatever thickness of restoration you desire to make. The tip or restoration should be at least two thicknesses of No. 28 gauge. After grinding down, as mentioned above, bevel the cutting edge very slightly all around, just sufficient to take off the sharp edge. Drill holes into the cutting edge on either side of the pulp an eighth of an inch deep, more or less, as the case will permit. Usually cases requiring this work are not very sensitive, owing to recession of the pulp. These holes, for an upper central incisor, should be the diameter of the pin of an ordinary rubber tooth (not the head of it); smaller teeth, pins in proportion.

Take 34 to 36 gauge pure gold, and burnish over the surface to be restored, being sure to have it run over the edge slightly, like the cover of a box. This is very important, and for it the separation was made. Ordinarily a wood point is the best thing with which to adapt

the gold to the tooth, the gold being very soft. A wad of bibulous paper pressed down with the wood is of assistance in the beginning. Then press with the wood point all over until a perfect adaptation is secured. When this has been done the dents in the gold show where the holes have been drilled in the tooth. Take a sharp point and pierce the gold for both pins. Take pure platinum wire exactly the size of the drill used. Make the ends small or slightly pointed, and press through the pure gold to the bottom of the hole. Often it is possible without waxing to withdraw the pin and gold together. If this can be done, hold underside of the pin with tweezers, apply minutest piece of 22-carat solder to the pin where it passes through the gold, hold over a small Bunsen flame or alcohol lamp and melt the solder. If the hole is no larger than the pin the solder will not run to the underside.

Now place on tooth and carefully press to place as before with wood point, being very careful that the edges fit perfectly. Put second pin in place and dry gold and pin; then apply brittle wax (made by heating equal parts of beeswax and gum dammar and stirring the same together while hot, then allowing to cool), remove gold carefully, invest, and solder second pin. Replace on tooth, again carefully press to place all over, cut pins off just at height finished piece should be, apply brittle wax as high as pins, carefully remove, paint under side with rouge and invest.

Have some 22-carat solder rolled very thin, cut size of tip and punch holes for pins. Put a minute quantity of borax on pure gold, drop solder over pins, prepare 22-carat plate same as piece of solder, drop in place, blow broad flame over the piece, and the solder will flow and the 22-carat gold will settle in its bed. Repeat the layers of solder and gold until you have the required height.

Remove investment, and if there is the remotest particle of solder on the under side, throw the piece into your scrap tray and begin again. If the minutest attention has been given to all the details it will not be necessary to throw the piece away. Supposing it fits perfectly, take off and finish roughly out of the mouth. It is more pleasant for the patient. Apply dam, mix a small quantity of oxyphosphate the consistency of cream, carry to bottom of holes with a fine smooth broach wound with a particle of cotton, put drop of cement on end of tooth, press tip to its place, and let patient bite it solidly home. Keep it there until the cement is set. Finish at next

sitting as perfectly as possible, and you have the strongest and best repair that can be made for the case.

With a little practice the same method can be successfuly employed in incisor teeth, when both corners are broken off, necessitating the carrying of a gold filling if one is made from the gum line on the mesial down to and across the cutting edge and up to the gum line on the disto-approximal surface. If the pulp is living in such a case the piece will prove a good one. If dead, with so much of the tooth gone, probably a well-made porcelain crown would be better. The success of this work depends upon absolute attention to details and perfect fit.—*International.*

PACKING AMALGAM IN CAVITIES IN THE PROXIMAL SURFACE. By E. K. Wedelstaedt, D.D.S., St. Paul. The DENTAL DIGEST for August, 1902, contains a short essay on packing amalgam in cavities in the buccal surface. In considering the subject I called attention to the necessity of using much care in packing amalgam. Reasons were given why the burnisher should not be used, and something was said about using amalgam pluggers of different sizes. Reference was also made to the results of some experiments on which I based the ideas advanced in that essay. In considering this matter of packing amalgam in cavities in the proximal surface, I ask that the reader familiarize himself with the ideas contained in the first essay written, so that he can better understand the views expressed in this.

Let me consider the last operation I made with amalgam in the proximal surface. The cavity was in the disto-occlusal surface of a lower right first molar. The teeth and gums were prepared for the reception of the rubber dam, which was then adjusted. The crowns of the second and first molars, as well as those of the second and first bicuspids, were exposed when the dam was adjusted. The cavity involved fully two-thirds of the proximal surface. The cavity was so prepared that the filling would be seated on a flat gingival seat. The cavo-enamel margin was at right angles to the axial wall. Lateral or parallel grooves or undercuts were entirely avoided. Anchorage for the filling was obtained by cutting a flat seat or step on the occlusal surface, and giving it the shape of a dovetail. When the cavity was finally prepared a matrix was made from a piece of copper, one-fiftieth of a millimeter thick. This was fitted around the

tooth, so that it extended from the buccal to the lingual groove. A Wedelstaedt tie secured it. The amalgam pluggers were then fitted to the cavity. The alloy was mixed and kneaded, and then packed into the cavity. Four pieces of amalgam were used. After the cavity had been filled the amalgam was left absolutely alone for about three minutes. It was examined and found to be very hard.

The ligature holding the matrix was then cut and removed, and the wings of the matrix turned back toward the second molar, thus exposing the amalgam at the distal angles. With a sharp knife the amalgam was trimmed from the main body of the filling toward the cavo-enamel margin. The matrix was then grasped and forcibly withdrawn. The trimming was continued until the filling was of the desired form. The point of contact with the adjacent tooth was not disturbed. The trimming was at all times away from it. When the trimming with the knife was finished a "medium" strip was passed through the interproximal space, to the gingival of the contact, to remove any sharp edges that had been overlooked. This completed the trimming of the proximal surface. The occlusal surface was cut to form with a pair of sharp rapid excavators, three millimeters in diameter. The dam was then removed, correction of the occlusion made, and the patient dismissed. At the next sitting the filling will be polished.

Why was it that parallel grooves were not cut? Why was the contact not disturbed while trimming the filling? In answer to the first question let me say that parallel grooves are at all times a menace to the strength of the tooth, and more often than not lead directly to the loss of the filling. We cannot pack filling material into grooves or undercuts as we can against a flat surface. During the past six or seven years I have on several occasions been compelled to remove a quick-setting amalgam filling which I had made in some proximal surface. Where small convenience pits had been made in the bucco and linguo-gingivo-axial angles, I found that these, trifling as they were, were more than sufficient for every purpose. Many of the quick-setting amalgams become very hard, and when much stress is placed on the filling there is a chance for fracturing the tooth where it has been weakened by making large and deep undercuts. Very often enamel cracks and black surfaces are observed beside these weak places. In view of these facts and the further one, that undercuts do not serve to add stability to a filling,

and tend only to weaken the tooth, they may as well be done away with when occlusal anchorages are made.

The point of contact was not disturbed in trimming the amalgam, for the reason that in polishing the amalgam the filling is always shortened a little mesio-distally. I prefer to do this at the time the filling is polished, and then I have some definite idea of its size. By reducing the size of the filling mesio-distally at the point of contact when trimming the amalgam, and then making a second reduction when polishing the filling, the exact contour desired is not always obtained. Therefore, I feel that it is better to let the point of contact alone till the filling is finally polished.

There are a number of things to be said on the subject of making amalgam fillings. But these can only be touched upon, for it is impossible to go into any great detail. The great majority of dentists seem to be of the opinion (I am judging from the operations I see) that "amalgam fillings are cheap things anyway; so I just squash them in." This, at least, is how one man expressed it. This is a grave mistake, and if followed is apt to lead to all kinds of trouble. It is far more difficult to make first-class amalgam fillings than it is to make first-class gold fillings. Many others seem to think that amalgam fillings need not have any special cavity preparation, need not be trimmed or polished; that amalgam placed in the proximal surfaces need not or cannot be contoured. Another class of dentists have been taught that as decay cannot take place in the margins around fillings made of amalgam, principles of extension for prevention can be ignored. A larger class still have been told that amalgam fillings made on decalcified dentin cause a recalcification of the decalcified mass.

When our knowledge was limited and our theories were based on suppositions, it was perhaps all very well to have sophistry of this kind brought to our notice. But with the development of our knowledge we know definitely that such things are wrong. It is our duty to become familiar with all the knowledge as it is developed for our consideration, and not follow along a beaten path, the end of which no man knows.

Recently a number of essays have appeared in which the writers allege that they are fully acquainted with the methods of extension for prevention, but they assert that they do not follow them, for their patients cannot afford to pay for the operations. This is very

peculiar reasoning. I should like to ask those who have had the courage to incorporate such thoughts in their essays and follow such methods in their daily operations, how they would like similar treatment from a surgeon? If a thing is worth doing at all it is worth doing well. If you cannot do the teeth on which you operate some little good, do not be guilty of doing them harm.

Before me lies a dental journal, dated May, 1902, from which I copy the following: "Where decay is rapid in growing mouths, or for that matter, at any period in life, gold as a filling material is contraindicated. It is better and safer practice to resort to either gutta-percha or amalgam to tide over these years." I would reply briefly that amalgam as a filling material has its place and use. It does not nor can it ever take the place of gold. The use of the two materials is separate and distinct and should not be confused. Where there is evidence of rapid decay going on gold should be used, for the simple reason that we all know what we can do with it. Many think that they know, but few really know what can be done with amalgam. Regarding the usefulness of gutta-percha, I can say only that it also has its place, and this place is not where gold or amalgam should be used.

In the selection of a filling material judgment is as necessary as it is that some study of conditions is at all times necessary prior to preparing cavities. If this is not given the case, the operation might just as well not be made, for in too many cases it is a temporary expedient only, which more often than not is quickly followed by something permanent from the hands of a more intelligent dental surgeon.—*Summary.*

ANEMIA IN CHILDHOOD. Dr. W. C. Hollopeter commented on the fact that the period of primary dentition was often a time of ill-health, complicated by improper food, sooner or later resulting in disturbance of the child's blood, producing marked anemia. After brief reference to the anemias of acute diseases and specific blood changes, the author stated that he believed dental decay, with consequent pus formation and septic involvement of the alimentary tract, was the foremost cause of anemia in children and most frequently overlooked by the general practitioner, although it is pretty generally recognized by the pediatrist. The care of the first teeth is too often neglected, resulting in hyperemia of the oral cavity,

with numerous alveolar abscesses and the consequent passage of pus into the stomach. With the teeth in this condition proper mastication is impossible, and this results in derangement of the gastro-intestinal tract and general catarrhal inflammation, producing irritability and laying a foundation for anemia that may require years of correct living to correct. The difficulty of curing chronic gastro-intestinal catarrh was discussed and the necessity of preventing this condition emphasized. This can be accomplished only by much medication, careful regulation of the diet and regime and careful toilet of the teeth. The period of second dentition is a time of great importance, as the nervous system is then unstable and particularly liable to be affected.

Among the conditions remarked as a result of the neglect of the teeth were stomatitis, ulceration, sloughings, gangrene, pyorrhea alveolaris, periostitis, alveolar abscesses, necrosis, recurrent tonsilitis, pharyngeal otitis, glandular inflammation, cellulitis and possibly meningitis. The opinion of a former coroner of Philadelphia, that 50 per cent of all deaths in children coming under his observation were due to oral sepsis, was quoted.

A second frequently unrecognized factor is mouth-breathing, due to nasal stenosis following whooping-cough, measles, influenza, resulting in catarrhal inflammations and hypertrophied turbinated tissue, serving to block the channel, which is indicated by the characteristic facies due to a deficiency of oxygen and causing anemia. The value of careful toilet of the nose and throat during the disease in order to prevent these conditions was remarked.

As a third causative factor was mentioned eye-strain, especially during school life, which is often due to poor print and defective light and ventilation. Many of the conditions of so-called headache, catarrh of the stomach and nausea are really due to eye-strain, and the reason better results in treatment are not secured is owing to the fact that therapeutic measures are directed to the manifest symptoms, while the real cause of the condition is unsuspected. In concluding, the author stated that he believed asepsis of the mouth was of as much importance to the physician as was asepsis to the surgeon.

Discussion. *Dr. E. E. Graham* stated that in considering anemia in children we should take into consideration the fact the composition of the blood in childhood is very different from its composition

in the adult, the proportion of the white blood corpuscles in the former being far in excess of that in the latter. It was also believed that in anemia there were substances in the blood intimately associated with many of the diseases. While splenic enlargement is an important factor in the diagnosis of anemia in the adult, cases have been observed in which this organ was markedly increased in size in children, yet where the anemia was only moderate. Almost any disease can produce a certain amount of secondary anemia in a child, and this he attributed mainly to two causes, decrease in the production of blood, caused by poor food, improper hygiene and poor assimilation, and increased destruction of the blood cells. The latter factor is particularly exemplified in nephritis, diphtheria, tuberculosis and cases of chronic suppuration and effusion, especially pleural effusions, and he cited a case in which three pints of pus had been removed by means of the aspirator, and the anemia was as marked as in a case of pernicious anemia. In such cases the hemoglobin is proportionately reduced as compared with the red blood cells, and in some cases the reduction is excessive, and leucocytosis may or may not be present. It is important to treat rather the cause of the disease than the disease per se, and prophylactic measures, such as correct hygiene and diet, to prevent the development of the cause, were recommended. Iron and arsenic were regarded as the most valuable drugs. The prognosis was felt to depend on the age of the child and the cause; the younger the child, the graver the prognosis. While dentition per se was not regarded as a very important factor in the production of anemia, the escape of pus into the stomach from the gastro-intestinal tract, and the consequent irritation of the latter, will account for a considerable proportion of the cases.

Dr. Samuel Wolfe, while he recognized the value of proper preservation of the teeth, and felt that carious teeth and bad hygienic oral conditions were no doubt responsible for some of the anemias in childhood, still believed that in many instances an impaired and defective condition of the blood resulting from heredity or other cause often led to decay of the second teeth. He felt that while proper hygiene of the mouth and teeth would prevent a portion of the vicious circle, we must go deeper into the causation of the condition in order to bring about a rapid cure, particularly in cases resulting from eye-strain, phimosis, and defective nutrition and metabolism. This fact was substantiated by the frequent occurrence of

anemia in children with defective vitality and weakened conditions. Malaria was also felt to be a frequent cause and should be considered in all cases.

Dr. H. Brooker Mills believed faulty dentition as a cause of anemia should be divided into three classes, absorption of pus due to suppuration of the gums; indigestion due to insufficient mastication, which is in turn due to bad teeth, and indigestion due to insufficient mastication, when the teeth are good. He felt that the larger proportion of the cases came under the latter class. A case was cited in which the patient had died of autointoxication due to constipation, attributed to indigestion due to faulty dentition, or rather improper use of the teeth, which were in good condition. Another case was noted in which gradual bleeding from the gums—presumably due to some purpuric condition—produced very profound anemia, finally resulting fatally. Eye-strain and mouth-breathing were regarded as frequent causes of anemia, and in many instances correction of these conditions had relieved the other symptoms.

Dr. William H. Good felt that fermentation going on in the mouth caused by constant eating, especially of sweets, was responsible for the production of a certain amount of the dental caries, and that if this dietary indiscretion were corrected, the formation of the conditions in the mouth and gastrointestinal tract would be prevented.

Dr. Hollopeter, in closing, stated that he had in mind dental caries in relation to second dentition, rather than to primary dentition as a causative factor of anemia, and he also felt that neglect to use the teeth was probably a more important point than had been generally recognized.—*Jour. Am. Med. Assn.*

Forcible Method of Collecting a Bill.—A dentist in Iowa was recently arrested and fined for beating up a patient who refused to pay a bill.

To Give Porcelain the Appearance of a Dead Tooth.—Burning a little sulphur on porcelain gases it and deadens its appearance.—W. A. Mills, *Cosmos.*

Vulcanization of Large Pieces.—Dr. Martin vulcanizes large prosthetic pieces at a temperature of 311 deg. F. for two hours, and never has to record cases of porosity.—*Australian Jour.*

Quinin as a Styptic and Antiseptic.—In aseptic wounds quinin absolutely stops parenchymatous bleeding, and has the additional power of rendering innocuous any germs that may have been conveyed into the wound by the operator's hands.—*Am. Jour. Med. Sc.*

Letters.

THE BOSS SUDDENLY BECOMES FAMOUS.

(AS TOLD BY THE OFFICE BOY.)

A man he come in the Offis one mornin', an' he wasn't dressed not as well as the Boss, even. Says he, "Kin I see the Doctor?" An' then he took out his Card, an' it had a big set of Teeth in one Corner, an' they was all Gilded. An' it said on it, "Doctor H. S. Rurel, Surgeon Dentist, Coonville, Tenn. Office next door to Ryan's Cooper Shop. Gold Fillings warranted for Life." He had a Big carpet Bag in his hand, an' it didn't take me long to size him up fer a Blood-Raw Member from the Scrub Oak region.

So I took his card in to the Boss, an' presently the Boss he Come Along In, to see what was the pertick'ler Outcry. The man he'd set down off in a Corner, like he was afeard he might strain the Furniture, an' when the Boss Come in he riz up an' made a Low Bow. Says he, "It's a Grate Privilege to Meet a distinguished member of our Perfession, like you, Doctor, an' I hope I reelize the Honor I'm enjoyin'." Then he Bowed way down to the Floor, agin, an' stood waitin' fer the boss to ast him to take a Seat. I seen right away that the Boss was Offul Took Aback. He looked jis' like he did the mornin' he was workin' for Mis' Dawson (she's the Ritch Stove Foundry's wife, over the river), an' Mis' Contour yelled at him from out in the Kitchen, to go to the Grocery an' git her a Nickel's Worth of Pepper.

But presently he seemed to recover his Presents of Mind, fer he cleared his throat an' says he in Gruff Tones, "I'm always glad to learn that my friends approve of my Perfessional Record"—like he'd invented a new Plugger, er Clamp. Then he sized the Stranger up, like he wondered what'n thunder it all meant. The man he stood there gazin' respectfully an' admirin'ly at the Boss, an' kind o' Suckin' the edge of his Hat-Brim.

So says the Boss, "Set down an' have a Seat," in a Condescendin' Tone of Vois. So the Stranger he set down, an' Silence Rained fer a Spell, like it was a Girl gittin' Sparked, an' the Feller wishin' he could think of somethin' to Say. After a Long Wait says the Boss —kind o' feelin' his Way, I reckon—"how—how did you happen to —er—to heer about me?" like he didn't know yit what he'd Done.

Then says the dentist—Dock Rurel, I said his name was—says he, "Why, what a Question, Doctor! When a man what's got a World-Wide reputation asts me sech a question as that, I ain't got but one conclusion: to wit, that he's doin' a little bit of a Funny Turn."

So then he Laffed, an' the Boss he never even Smiled, fer he knowed he'd got to Act Up to his reputation. I could see his Chist a-heavin' out, an' his chin went up two er three Notches. He begun to heave his Vois from the bottom of his Stummick, like the Governor of the State done once, when he was makin' a political Speech, in front of our Offis. Every once in awhile he'd Turn Round an' say to me, "James, the Door," when they wasn't nobody ringin', jis' to show his Importance, I reckon.

So then says Dock Rurel, "It mus' be Offul Gratifyin' to know the Eyes of the hull Perfession is fixed on you, Dock. At the same time, it mus' be a Offul Responsibility, feelin' that every movement o' yourn is observed in far distant quarters, as well as right here at home. Still, that's what men in all high positions has to Pay, fer bein' so Exalted. It's what I'd call a Mixin' Together of the Sweet an' the Bitter, Dock."

Dock Rurel he Got Up an' took a seat a little nearer to where the Boss was a-settin', like he wanted to see him Closter, an' be able to describe him better when he went back home, and people ast him what kind o' lookin' man Dock Contour was. It all seemed kind o' Queer to me; I hadn't Heered that the Boss was considered sech a Wonder. But you can't always tell, like the boys over the River thinks I'm the Champeon of our Ward, an' I ain't never licked only two fellers of my size, while three has Licked Me.

Jis' then the bell rung, sure enough, an' I opened it, an' in walked Dock Puffy. That was a Nother surprise, fer Dock Puffy he don't hardly ever come in our Offis, bein' in a Higher Class than the Boss. So the Boss he Shook Hands with him, an' ast him how practice was, an' was Collections good, an' Dock Puffy he said he didn't know, 'cause he'd got a Collector that looked after them matters, an' he never seen him exceptin' when he'd Come In the offis an' ast him whether he should buy another House, er would he ruther have him buy some Standard Oil er Electric Stock.

All this time it seemed like Dock Puffy he never noticed the stranger, Dock Rurel, an' the Boss he never thought to Introduce him. I think he was too Flustered, havin' Dock Puffy come in.

But after a Spell Dock Puffy he seemed to Discover somehow they was a Stranger present, an' he put up his eyeglass, an' he looked him Over, like he was a Prize Hog at the County Fair. The Stranger didn't seem to make no Impression on him, though, fer he went right on talkin' about Investments, an' how him an' Rockafeller an' a lot of the other Bloods was a-goin' to charter a Vessel an' go on a Pleasure Trip up to the North Cape, in Norway, the comin' Summer, an' he didn't want it Give Away, fer fear his Patients would raise a Muss ef they Heered he was goin' out o' Town that long.

So then Dock Rurel he struck up a Conversation with Dock Puffy, not waitin' fer no introduction, an' says he, "It's a wonder to me that you Folks livin' right here in the same town with our Friend that me an' you has so Happily met, this mornin', ain't done more than what you seem to of done, to show your appreciation of the important service he's done the Perfession. If it was down in Coonville, where I come from, they'd Sarynade him, anyhow, an' I wouldn't be Surprised ef they didn't raise a Monymint to him."

That seemed to Ketch Dock Puffy's attention, an' says he, "Who do you reckon he is, that you want to make sech a Fuss over him? What's he done? Blamed ef I've heered." Then Dock Rurel, says he, "W'y ain't he the Dean of your Dental College, an' ain't he the Leadin' Dentist of your city?" An' says Dock Puffy, "I hain't heered as yit who *is* considered the *Leadin'* Dentist of our City, but sense you've ast I may as well own up that I'm the Dean of the Dental College, myself."

When he said that it was a Puzzle to see the Expression on Dock Rurel's face. Says he, "May I ast your name?" So then Dock Puffy he handed him his card, with a Imperial Air. Dock Rurel he took it an' he read it careful, an' he looked mos' Offul Mystified, an' says he, "Is they two Dock Puffys?" Then says Dock Puffy, "Not as I know of." So then Dock Rurel he blinked a Spell, like he was all Twisted Up, an' then a Idee suddenly seemed to seize him. He riz up an' ast the Boss fer one of his Cards. Then the Boss he give him one, an' as soon as ever he read it says he, "I see they's been a Mistake. I've come to the Wrong Offis. Is your name really Dock Contour?" The Boss he looked like he thought it was some game to Rig him, but he says, right away, "Of course my name's Contour. What did you reckon it was?"

"I reckoned it was Puffy," says Dock Rurel. "Dock Puffy is the name I had in Mind, an' I thought this was Dock Puffy's offis. I ain't never heered of no Dock Contour, an' the dental journals don't make no mention of sech a Practitioner."

Dock Rurel he looked like he reckoned the Boss had knowed better all the time, only he hadn't Let On, an' was a-tryin' to git somethin' that wasn't rightly comin' to him. In fact, he give the Boss a look that said as plain as Words, that he considered him no better than a Hoss Thief er a Bugler, deceivin' him thataway. To make the matter more Aggervatin' he went acrost the Room an' took a Stand beside Dock Puffy, like it was arrayin' the hosts of Heavin agin the Hordes o' Satan.

The Boss he ain't so Sudden to take Offense, though he's Quick Tempered, when it comes to Jeerin' Words, er Outspoken Sass. But now he seen middlin' quick, that he was bein' Snubbed an' unjustly humbled right on his own Stamping-Ground, an' he turned in without delay to learn this Hayseed a lesson. The Boss he don't Weigh over a Hundred an' Forty, but anybody could easy see Dock Rurel wouldn't raise the beam at over a Hundred an' Fifteen anyhow. So then the Boss he seen it was his Meat, an' he Knowed sech a Chance wasn't likely to happen fer a Long Time, most of the Local Dentists bein' Middle Weights.

So says he in Tones more in Sorrow than in Anger, "It saddens me to discover evidences of sech Depravity of Natur in a Young Man fresh from the Soil. I had Hoped your Country Breedin' would preserve the Innocence of your Erstewhile Infantile Character, but this exhibition of Gall satisfies me that nothin' but Drastic Measures will suffice to Purge out of you the Dross your System seems to of Accumulated durin' the short hours of your Stay in our City. I find myself the Instrument Providentially appointed to set you Right, to apply Disciplinary measures fer your Reclamation." The Boss uses Offul High-Soundin' words, when he's gittin' ready to do anythin' out o' the Usual.

So then he suddenly seized Dock Rurel by the neck-band an' the Slack of his Trousers, an' he Rushed him out into the Yard, an' Soused his Head in a Tub standin' under the Pump. Dock Rurel he was Offul Took by Supprise but he had the Presents of Mind to Yell, an' after he'd been ducked nine or ten Times he Broke

Loose an' made over the fence, Head First, without stoppin' fer his Hat er nothin'.

The Boss he stood a-glarin' after him, an' Dock Puffy laffed out loud, the first time I ever Heered him. After Dock Rurel was Clean Gone the Boss he went over an' Shook Hands with Dock Puffy, Offul Solemn. Says he, "The Morals of the Odontologicostomatitical Society mus' be preserved at all Hazards, Dock Puffy. Let us hope this painful Spectacle will not Linger to disturb our Dreams this Night." But Dock Puffy he got done Laffin' presently, an' then he explained that he didn't see no Special Occasion for treatin' the Feller thataway, seein' as it was after all a Compliment to the Boss to be Mistaken fer the Leadin' Dentist in the City. "How he happened to make sech a Egregious Mistake though, I don't noway see," he added.

The Boss he's got a Good Deal of Respect fer Dock Puffy, but that was a little too Much. It so Happened that the Boss was washin' his hands at the Tub, jis' as Dock Puffy said that, an' says he, "What do you mean by that remark, sir!" An' then like he'd been Suddenly Seized with one o' them Frenzies that ketches him lately, he up with a big Sponge layin' in the water-trough, an' he Banged Dock Puffy right in the Mouth with it. The water Squshed all over Dock Puffy's face an' his clothes, an' he was a Sight! It was a Thrillin' Moment, an' I looked to see a Set-To wuth goin' a Thousan' Miles to Witness, them two bein' near the Same Weight. But to my Supprise an' Disgust Dick Puffy he looked kind o' Stunned a Minute, an' then he walked out in the Kitchen, swabbed his face on the dish-cloth, an' act'ally Snuck Oft the back way, never lookin' back.

Cincinnati. FRANK W. SAGE, D.D.S.

READING IN BED.—Dr. Carl Seller argues that the recumbent posture allows more rest of all the bodily functions, and relieves the congestion of the eyes; it is therefore a very good position for reading.

CYST OF SUPERIOR MAXILLA.—Maass reports the case of a boy of twelve years old, in whom there developed a tumor filling the canine fossa. This growth appeared eighteen months after the extraction of two teeth for a periostitis at the root. This tumor was covered with a thin, bony plate. Exploratory puncture brought forth the contents, which were composed of leukocytes, cholesterine crystals, and pavement and cubical epithelium. The tumor was a cyst of the root of the tooth, due to a proliferated epithelial formation.—*Gaz. Heb. de Med. et Chir.*

The Dental Digest.

PUBLISHED THE FIFTEENTH DAY OF EVERY MONTH
At 2231 Prairie Avenue, Chicago,
Where All Communications Should be Addressed.

Editorial.

FILL UP THE QUESTION CARD.

The executive committee of the Illinois State Dental Society has sent a card to every member with the request that he will put on it any questions that occur to him, or any problems that come up in his practice prior to March 1, 1903. The cards are then to be mailed to Dr. C. J. Sowle, Chairman of the Executive Committee, Rockford, Ill.

The name need not be signed to the card, and, even if it is signed, it will be kept private and no one will know by whom the questions are asked. The questions will be answered by members of the Society capable of looking at the various problems in the broadest manner. The idea is a very good one, and if successfully carried out will be a most interesting and helpful addition to the regular program. We would urge every member to fill up the card.

ODONTOGRAPHIC SOCIETY OF CHICAGO CLINIC.

One year ago the Chicago Odontographic Society decided to celebrate its fifteenth anniversary, which occurs February 16-17, 1903, by giving a clinic unsurpassed in the history of the dental profession. Various committees were accordingly appointed and the work begun. It was the intention from the start to make the meeting national in character, so gentlemen of international reputation were invited to read papers and give clinics. The program committee, specially appointed for the purpose, decided to have five men from each state, so as to give the clinics great variety and let them represent the methods of the whole country. Already thirty-six states can be counted on for a full representation. The papers are not many in number but are of unusual interest and excellence. The essayists are Drs. E. C. Kirk, Philadelphia; R. Ottolengui, New York; W. W. Evans, Washington; A. E. Webster, Toronto; H. P. Carlton, San Francisco.

A feature of special interest will be the exhibits. The committee in charge of this work has made every arrangement for the convenience of the exhibitors and it is confidently expected that a greater number will be present and that the character and variety of display will be better than at any previous meeting.

All railroads have granted a rate of a fare and a third on the certificate plan.

Large delegations are coming from several States, many notables will be present, and every indication points to the biggest meeting ever held in the history of dentistry. The affair will wind up with a big banquet at the Auditorium, which promises to be a memorable event. We congratulate the Society that conditions are such as to make so magnificent a meeting possible, and we would urge the profession all over the United States to attend. Those who stay away will miss more than they realize.

Dr. Geo. B. Perry, chairman of the executive committee, or Dr. C. E. Bentley, chairman of the program committee, will be pleased to give any information pertaining to the exhibits or program.

OFFICE RIGHTS.

When will dentists not bite at office rights? When will dental journals not assist such fakes? In the second issue of the *American Dental Journal* appears an editorial advertisement for Dr. Carmichael's *system* of crown and bridgework. A nice way to open the first volume of a journal! It is rather an apology for Carmichael, because it says he teaches the dentist how to do the trick for fifty dollars, while as a matter of fact, Carmichael has his method patented, he says, and sells you office rights for one year or for perpetuity. Is this teaching? What a jolly! There is nothing to the system, and at its best it is not much better than swinging bridges on open-faced crowns, *e. g.*, grind the lingual cusp of a molar or bicuspid away considerably to allow for two thicknesses of gold, and cut a groove deeply through the sulcus and down the mesial and distal surfaces, burnish pure gold into this groove and over the ground portion, and then swedge 22 karat plate to this tomake the proper contour, thus the abutment is made so that no gold shows on buccal surface. Fifty dollars, please! This is the same as Dr. George Evans of New York demonstrated at the practitioners' course four or five years ago in Toronto. It is whispered round that Carmichael found takers in Toronto. Doubtless these were the men who didn't think it worth while to attend Dr. Evans' course. It didn't cost enough. As usual in such cases, a long list of testimonials was presented. A personal

letter of a prominent professor in a Western dental college was "judiciously displayed," using the words of the Niles' Michigan Hospital fake. Does anyone suppose this gentleman paid his fifty? Not much—he gave his testimonial, and suckers were caught. "A sucker is born every minute." What's next, and who's next?

We reprint the above editorial from a recent issue of the *Dominion Dental Journal.* Greatly to our surprise, we learn that several members of the Protective Association throughout the country and even in Chicago, as well as many dentists who are not members, have bought office rights from Carmichael. We have repeatedly urged and requested members of the Association never to purchase a license, buy office rights or pay royalty without consulting us. In the present case, had the members written us for advice they could have saved their money and they would not have contributed to a cause which we believe is not legitimate.

The editor very properly criticises those dental journals and practitioners who aid by testimonials these vendors of office rights. An alleged new crown has recently been patented, and the licensee is inclosing with the blank office-right application a list of testimonials from prominent men. A dentist of Texas writes us as follows, "This is the kind of stuff we are receiving down here in the southwest all the time. What encouragement have we to be honest, honorable, ethical members of the profession when such a scheme as this, apparently at any rate, is indorsed by men who are supposed to be examples for the younger members of the profession?" We quite agree with the sentiment expressed by our correspondent.

PLANS OF THE DENTAL PROTECTIVE ASSOCIATION.

At the recent annual meeting the present officers were reelected, and a resolution was passed providing that the chairman should appoint a committee of seven, choosing representative men from various parts of the country, to consider the situation and devise ways and means of reorganizing the present Association or forming a new one. This committee will be named in the near future.

The circular sent to the members brought several hundred replies, most of them containing suggestions. It is impossible for the chairman to reply personally to all these letters, so he takes this opportunity of acknowledging their receipt and of thanking those members who sent words of encouragement and commendation. All those

suggestions which seem practicable will be turned over to this new committee.

What the present organization has accomplished is a good illustration of what could be done if the profession could be more generally interested. That the dentists of this country should have a permanent organization for defense is universally conceded. Any organization to be permanent must include larger and more varied interests than exist in the present body. This need was apparent to your editor several years ago, and at that time we formed a second association to interest a larger number, with the view of making it permanent. This move, however, did not receive the indorsement which we expected, so we abandoned the idea, and it is now up to the profession to decide what they wish to do and to carry it out.

The Protective Association has not interested nearly enough of the dentists, and there is nothing now to induce the non-members to join, so the membership list is not only not increasing, but is diminishing every year, owing to deaths or changes of occupation of the old members. There is no revenue, so the organization must of necessity go to pieces in a little while if not disbanded. No one regrets this state of affairs more than your editor, as the time and labor we spent in organizing the Association were almost as great as the work involved in taking care of the patent litigation for the past fifteen years.

Already various individuals are making their plans to bleed the profession on patent devices, office rights, etc., and no men are an easier prey to such schemes than the dentists of this country. Before the Protective Association was organized we were importuned to take stock in and become a part of the International Tooth Crown Company. We suggested that if the dental profession would band together the Company could be prevented from collecting royalty, and were met with the reply that "The dentists never had and never would band together, and for this very reason royalty can be collected on worthless patents just as well as on legitimate ones." If we had not already had experience in attempting to get the dentists to cooperate we would think it an easy matter to band them together, but our experience has lessened our hopes and dampened our enthusiasm, and we deem it impossible for any individual or even a few men to accomplish this most desirable object, yet if the thinking men of the profession could be aroused a permanent organization could be perfected.

Notices.

INDEX FOR 1902.

The index for Vol. VIII of the DENTAL DIGEST will be mailed with the issue of January, 1903.

OHIO STATE DENTAL SOCIETY.

At the thirty-seventh annual meeting of the Ohio State Dental Society, held at Columbus, Dec. 2-4, 1902, the following officers were elected: President, J. B. Beauman; 1st Vice-president, J. F. Stephan; 2d Vice-president, W. T. McLean; Secretary, S. D. Ruggles; Treasurer, C. I. Keely.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The semi-annual meeting of the Wisconsin State Board of Dental Examiners will be held at the Hotel Pfister, Milwaukee, Jan. 26, 1903. All candidates wishing to take the examination to practice dentistry in this state will present themselves at 9 a. m.

J. J. WRIGHT, Secy., Wells Bldg., Milwaukee.

DISTRICT OF COLUMBIA DENTAL SOCIETY.

The thirty-sixth meeting and banquet were held at Washington, Dec. 12, and the following officers were elected: President, L. F. Davis; Vice-president, W. D. Monroe; Recording Secretary, S. W. Bowles; Corresponding Secretary, Wms. Donnally; Treasurer, M. F. Finley; Librarian, H. C. Thompson; Essayist, W. W. Evans.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

This Society will celebrate the fifteenth annual meeting with a two days' clinic, Feb. 16-17, 1903. Papers of great interest will be read by representative men, and there will be more than one hundred and fifty clinics, demonstrating practical methods of all kinds. The profession everywhere is cordially invited.

C. N. JOHNSON, President.
F. H. ZINN, Secretary.

RESOLUTIONS BY LOS ANGELES ASSOCIATION OF DENTAL ALUMNI.

At a regular meeting of the Los Angeles Association of Dental Alumni, held Tuesday evening, Dec. 2, 1902, the committee on resolutions submitted the following, which were adopted, upon the death of Dr. Harry Hubert Herren:

Whereas, It has pleased the Great Creator of the Universe to remove from earth's trials and sorrows our beloved friend and colaborer, Harry Hubert Herren, a tried and faithful officer and member of this Association, it is meet and fitting that we should place on record our appreciation of his many virtues as a friend, and of his earnest and valued services to the profession

he loved. In the prime of life, full of energy and earnestness in professional work, he clung to duty long after the germs of disease had numbered his days among us. May his example of courage and cheerful submission inspire us along the pathway of life, and his manliness and friendliness ever receive our most profound appreciation and respect; be it, therefore,

Resolved, That by this sad event our Association has lost one of its most honored members, and the dental profession an earnest and progressive professional gentleman, a genial and fast friend.

Resolved, That bowing to the will of Him who hath given and now hath taken the spirit of our friend, freed from the dross of disease and suffering, and purified for the life beyond, we hereby express our heartfelt sympathy with his bereaved wife and aged parents; and be it further

Resolved, That a copy of these resolutions be spread upon the minutes of this Association, transmitted to his family, and published in the dental journals.

EDGAR PALMER,
W. R. HOLIDAY,
H. D. REQUE,
} Committee.

RESOLUTIONS BY MASSACHUSETTS BOARD OF REGISTRATION.

At a meeting of the Massachusetts Board of Registration in Dentistry the following resolutions were passed:

Whereas, In the sudden death of Dr. J. Searle Hurlbut the Massachusetts Board of Registration in Dentistry mourns the loss of one of its original members, who for nine years of its existence served with exceptional distinction, four years of which he was president; therefore, be it

Resolved, That as an examiner he displayed remarkable wisdom, fairness and judgment, and showed wonderful tact in his dealing with men.

Resolved, That in his contact with his associates on the Board his kindness of nature and generosity of heart will always be remembered with the warmest affection.

Resolved, That we extend our sincere and heartfelt sympathy to his widow in this sad affliction.

Resolved, That these resolutions be entered on the records and a copy be sent to the widow of the deceased and to the several dental journals for publication.

JOHN F. DOWSLEY,
GEO. E. MITCHELL,
THOS. J. BARRETT,
DWIGHT M. CLAPP,
GEO. A. MAXFIELD.

November 20, 1902.

HARRY HUBERT HERREN, D.D.S.

Died at Pasadena, Cal., Nov. 27, 1902, from tuberculosis, Harry Hubert Herren, D. D. S., age twenty-eight years. Dr. Herren was born in Smith

County, Kansas, March 20, 1874, and moved to Pasadena in 1886. He went to Chicago in 1896 to begin the study of dentistry in the Chicago College of Dental Surgery, from which he graduated in 1899. He moved to Los Angeles and took up the practice of his chosen profession, making a specialty of Orthodontia, and was associated with the Dental Department of the University of Southern California for two years as an instructor in that branch, when his health compelled him to resign. He was one of the most active members of the Los Angeles Association of Dental Alumni, and was elected its president in 1901. He was also a member of the Southern California Dental Association. He was married in Chicago to Miss M. Victoria Ackerman, who survives him.

It was a painful shock to the members of the Southern California Dental Association to hear of the death of their fellow-member, Dr. H. H. Herren.

It is but three short years since he came to Los Angeles and opened a dental office. He at once identified himself with our societies and became one of us. We recognized in him from the first a man of sterling worth and a dentist of unusual ability. He easily maintained this position and grew into the confidence of the public. He was ever ready to contribute of his means and of his skill to render more interesting and more profitable our professional gatherings. As a Society, as well as individually, we shall miss him, and feel his absence as a great loss.

The Society desires through its Committee to express its sorrow, and to extend its condolence to the bereaved friends.

Our hearts go out to the loved and now sorrow-stricken wife, his companion at many of our gatherings. To her we desire especially to tender our heartfelt sympathy, but at such a time words utterly fail to carry what we would put in them. We can only leave her to the great heart of our Heavenly Father.

J. D. Moody,
E. G. Howard,
H. S. Miles,
} Committee.

LATEST DENTAL PATENTS.

709,812. Mouth mirror, G. S. Bennett, J. W. Thatcher, San Francisco.
709,834. Dental gauge, C. R. Vanderpool, Grand Rapids, Mich.
709,973. Dental apparatus, L. Eilertson, Paris, France.
711,324. Artificial denture, W. P. Lacy, So. Boston, Va.
711,340. Mandrel, G. J. Paynter, Philadelphia.
711,827. Electric heater, J. Cook, J. M. Pumerville, Michigan City, Ind.
712,057. Annealing furnace, N. K. Garhart, Indianapolis.
712,526. Filling tool, P. C. Hammersmith, Buffalo,.
712,576. Dental instrument, J. F. McMath, Oakland, Cal.
712,716. Electric engine, O. H. and A. F. Pieper, Rochester.
712,813. Dental plugger, F. W. Korb, Cleveland.
713,040. Bridgework, E. L. Townsend, Los Angeles, Cal.
713,041. Band-fitting instrument, E. L. Townsend, Los Angeles, Cal.
713,103. Foot engine, F. Hurlbut, Chicago.
713,273. Matrix-crown, I. H. Alexander, Camden, S. C.

713,282. Dental chair, A. W. Browne, Prince Bay, N. Y.
713,319. Tool-holder, C. A. Lundberg, New York.
713,469. Dental appliance, G. G. Martin, Pecos, Tex.
713,470. Forceps, W. T. Martin, Yazoo City, Miss.
713,826. Dental Handpiece, J. D. Wilkens, Chicago, assignor to Dental Protective Supply Co.
714,105. Dental heater, G. Evans, New York.
714,373. Electric furnace, A. M. Hewett, J. C. Smith, Chicago.
714,613. Handpiece, A. W. Schramm et al., Philadelphia.
714,938. Dental oven, J. A. McClelland, Chicago.
714,983. Dental instrument, C. P. Wilson, Newton, Mass.
715,182. Dental flask, W. Waegel, Reading, Pa.
715,216. Producing amalgam, A. Shaw, R. Stevens, Cambridge, Mass.
715,447. Dental plugger, J. D. Wilkens, Chicago, assignor to Dental Protective Supply Co.
715,492. Dental bridge, H. A. Littig, Davenport, Ia.
716,676. Cement injector, H. L. Cruttenden, Northfield, Minn.
716,677. Cement injector tube, H. L. Cruttenden, Northfield, Minn.
716,781. Dental occlusor, C. L. Stocks, Greenville, Tex.

News Summary.

J. J. HERNDON, a dentist at Bennettsville, S. C., died Nov. 10.

J. F. WRIGHT, a dentist at Clinton, Ia., died suddenly Dec. 17.

S. A. SMITH, a dentist at Maysville, Ky., committed suicide Dec. 7.

M. TANNEHILL, 62 years old, a dentist at Confluence, Pa., died Dec. 11.

CHARLES DIPPOLT, 69 years old, a dentist of Trenton, N. J., died Dec. 15.

G. A. ANDREWS, for several years a dentist at Lyons, N. Y., died Nov. 27.

J. K. BICKELL, 62 years old, a dentist at Andover, Mass., committed suicide Nov. 25.

H. M. RAGON, 62 years old, a dentist at Bath, Me., died Nov. 22, after a short illness.

J. B. WORLEY, 55 years old, a dentist at Monmouth, Ill., died Dec. 7, from heart failure.

H. D. ATKINSON, a young dentist of Richmond, Va., died Nov. 24, from typhoid fever.

F. H. SMITH, 40 years of age, a dentist at Sewickley, Pa., died Dec. 11, from pneumonia.

M. W. SMALL, 86 years old, a dentist at East Providence, R. I., died Dec. 6, from pneumonia.

C. A. BUDD, forty-five years old, a dentist at Muncie, Ind., died Nov. 22, after a short illness.

G. A. TABER, 71 years old, a dentist at Boston, Mass., died suddenly of heart disease, Nov. 16.

L. C. FULLER, a dentist at Kansas City, had a stroke of paralysis Nov. 18 and is in serious condition.

F. A. BADEN, 36 years old, a dentist of Baltimore, died from heart disease, Nov. 18, at Richmond, Va.

J. A. MAYER, a dentist of New York, was found dead in the Harlem River recently, and foul play is suspected.

FALSE DOCTRINE was recently defined by a school-boy as "when the doctor gives the wrong stuff to people who are sick."

QUITE SUFFICIENT.—Doctor: Have you been able to keep anything on your stomach? Patient: Nothing but my hand.—*Life.*

G. H. SLYFIELD, 39 years old, and formerly a dentist at Waukegan, died Dec. 9, at San Antonio, Cal., from consumption.

DIVORCE.—Nov. 25 Mrs. Mary E. Slonaker was granted a divorce from her husabnd, J. W. Slonaker, a dentist of Chicago.

ACCIDENT.—Nov. 19 a vulcanizer in the University of Buffalo Dental Department blew up and slightly scalded several students.

DENTIST AS DUELIST.—F. C. Wilson, a dentist of Savannah, Ga., and J. S. Schley, a cousin of Admiral Schley, have challenged each other to fight a duel to the death.

SPRINGFIELD (O.) DENTAL ASSOCIATION held its annual meeting Dec. 8, and elected the following officers: President, W. A. Barber; Secretary and Treasurer, P. Willwine.

NEW DENTAL COLLEGE.—The Northern College of Dental Surgery of Chicago was licensed Nov. 18. The capital is $2,500, and the incorporators are F. F. Tollkuehn, A. D. Radcliffe and E. F. Neal.

CEDAR RAPIDS (IA.) DENTAL SOCIETY held its annual meeting Nov. 14, and elected the following officers: Pres., L. E. Richardson; Vice-president, J. B. Hepler; Treasurer, S. G. Grove; Secretary, J. H. Calder.

CLEVELAND DENTAL SOCIETY held its annual meeting Dec. 1, and elected the following officers: President, S. J. Spargur; Vice-president, J. W. McDill; Secretary, W. H. Ramaley; Treasurer, Frank Ackerman.

WEIGHT WANTING.—Reports come in from time to time that dentists have been cheated by selling their gold scraps to men who used short-weight scales. Better send your scrap to some reputable supply house or refiner.

BELOIT (WIS.) DENTAL ASSOCIATION held its annual meeting Dec. 15, and elected the folowing officers: President, G. A. Cleophas; Vice-president, J. A. W. Meyers; Secretary, E. S. Pettitt; Treasurer, James Bradley.

ALTRUISTIC.—Dentist: You look as though you had been suffering from toothache. Woman: Yes, I haven't slept a wink for two nights. Dentist: Let me see the tooth. Woman: Oh, it's my husband's.

SYRACUSE, N. Y., DENTAL SOCIETY held its annual meeting Dec. 2, and elected the following officers: President, W. F. Engle; Vice-president, A. M.

Lafayette; Secretary and Treasurer, C. M. Ryan; Corresponding Secretary, C. H. Barnes.

MILWAUKEE DENTAL SOCIETY held its annual meeting Dec. 2, and elected the following officers: Pres., A. Gropper; Vice-president, W. S. Griffiths; Secretary and Treasurer, A. F. Kortebein; Member Board of Censors, W. A. Perkins.

POOR-HOUSE FOR DENTIST.—M. F. Buckley, formerly a capable and successful dentist of Boston, was recently arraigned in the police court on the charge of vagrancy and sent to the state farm for a year. Drink and drugs caused his downfall.

WEDELSTAEDT DENTAL CLUB was organized Dec. 17 at Cedar Rapids, Ia., with a membership of thirty, and the following officers were elected: President, W. R. Clack; Vice-president, J. B. Conzett; Secretary and Treasurer, Wm. Finn.

COUNTY DENTAL SOCIETY held its annual meeting at Watertown, N. Y., Dec. 8, and elected the following officers: President, G. E. Coe; Vice-presidents, W. G. Smith, P. E. Dowe, B. N. Bailey, Fred Hosley; Secretary and Treasurer, R. A. Clarks.

CONNECTICUT DENTAL CLUB, organized to honor the memory of Dr. Horace Wells, held its eighth annual meeting Dec. 12, and elected the following officers: President, Henry McManus; Vice-president, A. C. Fones; Secretary, Charles McManus.

NECESSITY CREATED.—When at last a physician came and settled among them, the people wondered. "Nobody is ever sick here," they said. "Of course not, with no medical assistance at hand," said the doctor, smiling at their simplicity.—*Life.*

JAW-BREAKERS.—We copy the following from the catalogue of a Swedish dental supply house: Pimpstenspapperstrissor, Karborundum-Kautschukslipspetsar, Kvicksilfverbehallare. The dealers of this country have much for which to be thankful.

LOS ANGELES ASSOCIATION OF DENTAL ALUMNI met Dec. 4, and elected the following officers: President, J. D. Moody; Vice-president, H. D. Reque; Secretary and Treasurer, G. M. Crow; Corresponding Secretary, J. F. Cook; Board of Directors, A. T. Covert.

COFFEE AND PYORRHEA ALVEOLARIS.—The use of coffee hinders the elimination of tissue-waste, and is therefore injurious in the presence of gout and rheumatism. It should be forbidden by the dentist to the patient whom he is treating for pyorrhea.—J. B. ERNSMERE, *Cosmos.*

TEMPERATURE AT WHICH TO POUR ZINC.—Thrust into the molten zinc a piece of dry white pine; if it chars badly the metal is too hot; if it chars very slightly—say a coffee-brown—it is about right. The cooler you can pour the zinc the better it will flow.—*Dental Of. and Lab.*

NURSES MUST HAVE GOOD TEETH.—A training school for nurses at Cleveland has announced that all applicants must present with their teeth in good

order. This is a commendable decision and could well be followed by all schools for nurses throughout the country.

INDICTMENT FOR DENTIST.—Last month we announced that H. Gulmyer, a dentist at Elkhart, Ind., had shot a young woman of whom he was jealous. Contrary to expectations, she is getting well, but the grand jury has indicted the dentist and he will be tried for attempted murder.

THE DENTAL WORLD.—The editors of this publication announce in the December issue that it will appear no more. It was the official organ of the Georgia, Florida and South Carolina dental societies, but did not receive sufficient support to warrant its backers in continuing publication.

NEW HAVEN (CONN.) DENTAL CLUB held its fourth annual meeting Dec. 9, and elected the following officers: President, W. H. Metcalf; Vice-president, W. S. Horton; Secretary, G. W. Johnston; Treasurer, R. M. Gaylord; Ex. Com., E. S. Gaylord, Chairman, F. W. Brown, H. S. Bascom.

LOCATIONS.—S. F. Scott, a physician at Waukomis, Oklahoma, states that any dentist wishing a location can secure one by writing him.—The postmaster at Moulton, Ia., writes that the town needs a good dentist, having a population of 2,000 and only one old-school dentist to look after it.

ST. LOUIS DENTAL SOCIETY held its annual meeting Dec. 2, and elected the following officers: President, T. E. Turner; 1st Vice-president, H. Prinz; 2d Vice-president, C. D. Lukens; Corresponding Secretary, DeCourcey Lindsley; Recording Secretary, J. F. Austin; Treasurer, J. G. Pfaff; Librarian, G. H. Gibson.

FIRES.—C. H. Hayward, Peterborough, N. H., Dec. 7, loss $1,000, insurance $400.—C. S. Kyes, Peterborough, N. H., Dec. 7, loss $500, no insurance.—G. C. Smith, Centerville, Md., Dec. 14, total loss.—F. Hefner, Monticello, Ia., Nov. 30, total loss.—J. G. Atterberry, Tecumseh, Neb., Nov. 30, loss $800, insurance $600.

HARDENING PLASTER CASTS.—Dissolve boric acid in warm water and add sufficient ammonia to form the borate which remains in the solution. Use cold, either employing the liquid in mixing the plaster or applying it to the surfaces with a brush. The surface becomes hard after two days; the interior more slowly.—*Medical News.*

NEW JERSEY DENTISTS TO COMBINE.—The Central Dental Association of Northern New Jersey has decided to compile a list of all "deadbeat" patients known to its members, and to furnish a copy of this list to every dentist belonging to the organization. It would be well if the dentists of every city in the country would do the same.

INDIANA AFTER FAKIRS.—The Indiana State Dental Association is trying to have a law enacted so that all applicants for registration shall be examined by the state board, whereby protection will be given to the reputable dentists and to the community at large against advertising "fly-by-nights." In other words, dentists want the same protection that is given physicians.

TEMPERING STEEL TOOLS.—Two cold-chisels, heated to a cherry-red and tempered—the one in a solution of carbolic acid and the other in water—were set

to work on extra hard wrought iron. It was found that the one tempered in water became notched after a short time, while the one tempered in carbolic acid remained perfectly intact.—M. LEVAT, *The Engineer.*

ILLEGAL PRACTITIONERS.—Dec. 9 a dentist at Victor, Colo., was fined $100 for practicing without a license. His defense was that a permit had been given him several years ago and he supposed same was still good. Dec. 17 a dentist at Tecumseh, Va., who was practicing without a license, concluded that discretion was the better part of valor, and left for parts unknown.

FATALITIES.—Nov. 13 a man at Lewiston, Me., swallowed his false teeth and died from strangulation.—Dec. 17 a man at Norristown, Pa., had a tooth extracted and during the process his jaw was fractured. Blood-poisoning set in and his condition is serious.—Dec. 12 a woman at Covington, Ky., had a tooth extracted, and remained in a state of apparent coma for several hours afterwards, but finally recovered.

DENTIN OBTUNDENT.—Solution of ammonium carbonate. *Preparation:* Sublimation of one part of ammonium chlorate and two parts of chalk, and solution in four parts cold water. The liquor is volatile and has only a faint ammoniacal odor. To be applied in five to twenty per cent solution; acts in five to ten minutes. Can be recommended. Cannot be used for hypodermic injection, but the anesthesia produced is very efficient.—DR. THIERSING, *Register.*

ROBBERIES.—Dec. 22, Dr. L. C. Drake of Chicago lost $100 through thieves. —Dec. 21, Dr. B. J. Cigrand of Chicago was robbed of $1,100 worth of stuff. —Dec. 3, a dentist at Peoria, Ill., lost $50 through sneak thieves.—Nov. 22, a dentist at St. Louis was robbed of $50 worth of material.—Nov. 24, a woman at East Hamilton, O., left her pocketbook in the dentist's waiting-room while she was in the chair, and a young boy confiscated it and some other portable articles.

GUAIACOL IN THE EXTRACTION OF TEETH.—Guaiacol (chem. pure), 1 gram; olive oil (sterilized and neutralized), q. s. to make 10 c.c. For hypodermic injection, for tooth extraction, the effect of guaiacol is at least equal to that of cocain, and in certain cases in which the cocain does not produce the desired effect, as in periostitis, pure alveolar abscess and radicular cysts, guaiacol produces perfect analgesia. Being entirely non-toxic and not caustic its use as an agent for the painless extraction of teeth should become general.—DR. B. MARECHAL, *Cosmos.*

ZINC IN A VULCANIZER.—R. E. Luther, Batavia, N. Y., in *Brief.* If any member of the profession is following the suggestion in *British Journal of Dental Science,* about putting zinc in the vulcanizer for the purpose of keeping the flask clean, he will find himself in trouble in a short time. Zinc in a vulcanizer will in a short time decompose hot water, evolving hydrogen; and when there is enough of it to replace the steam the regulator will be operated by hydrogen pressure and the heat will go down, causing the plate to come out soft at the end of the vulcanizing time.

EXAMINING BOARD AFFAIRS.—At the last meeting of the Massachusetts

Board of Dental Examiners forty-seven candidates were examined and nineteen passed.—At the last meeting of the Connecticut State Board of Dental Commissioners sixteen candidates out of twenty-three passed the examination.—C. G. Gray of Petoskey has been appointed a member of the Michigan Examining Board to succeed F. O. Gilbert of Bay City.—Nov. 17, the California State Board elected the following officers: President, C. A. Herrick; secretary, F. G. Baird, San Francisco; treasurer, J. M. Dunn.

CANCER AND CARBONIC ACID.—There is a remarkable coincidence between the spread of cancer and the largely increasing consumption of effervescent wines and waters. Prior to the sixties champagne as a drink was used but occasionally, nor were aerated waters consumed in anything like the quantity or frequency that they now are. The upper classes by constantly imbibing effervescent beverages, solutions of carbonic acid of greater or less strength, so prepare their mucous tissues as to make them a favoring host to the cancerous fungus, if fungus it be.—*London Medical Times.*

IT SHOOK HIS FAITH.—(From the *Syracuse Herald.*) Little Harold had been told in Sunday school that the Lord would heal in answer to prayer. A thunderstorm happened to be raging at the same time Harold had a jumping toothache, and his mother overheard this: "Oh, Lord, stop my toothache." Silence for thirty seconds. "Oh, Lord, please do, for heaven's sake, stop my toothache." More silence; then a crash of thunder, then: "Oh, Lord, please do stop that durn thunder long enough to listen to me." The next day Harold had his tooth pulled, and now he wouldn't be a Christian Scientist for $1 cash and an air gun.

IMPRESSIONS OF THE FACE.—Oil the face with white vaselin and put a headcap on, to prevent the plaster from falling into the hair. Put plaster all across the forehead and sides of the face, to prevent the impression from sagging, and after the plaster has been flowed up to the alæ of the nose, insert a tube so that respiration is not interfered with. The plaster should then be built over the central portion of the face and nose. In using slow-setting plaster use wet towels to keep the face cool. Remove the plaster cast down, pulling off toward the center of the nose. Varnish the impression with sandarac, then use soap as a separating medium.—*Western Dent. Jour.*

ADVERTISEMENT EXTRAORDINARY.—A Paris dentist advertises to speak French, English, Russian, Polish, Italian, Spanish, Portuguese, and then modestly announces in English: "It is quite unnecessary to extract the teeths with the new system discovered by the American doctor. New application made by electricity at each operation without any danger and sufferings. Set of teeths aluminium-enameled strong and solid weighing 3 gramm. Without springs and hooks. The teeths cannot moving in speaking nor eating. The word, the voice, nor the smell are touched. Appearance of artificial teeth cannot be seeing at the mouth's examen. All are entirely hygienic: each part are accessible to the brush—any particule of food cannot stay in the interstices; by this mode they occupied the place of exactly natural teeths and stay much longer time that any system of artificial teeths."

DISINFECTION OF INSTRUMENTS.—The official spirit of soap of the German

Pharmacopeia offers a convenient means of effectually sterilizing surgical instruments. This spirit is made by combining six parts of olive oil with seven parts of caustic potash, subsequently diluting with thirty parts of alcohol and seventeen of water. The caustic action of the potash is neutralized by the olive oil and water.

Instruments thoroughly washed with this solution, or simply wrapped snugly in cotton saturated therewith, may be kept aseptic for considerable periods of time. Exclusion of air is an important consideration.

The same agent may be employed to disinfect the hands of the operator, or skin of the patient, as it is harmless even when applied in full strength.—*Deut. Med. Zeitung.*

MARGINAL ULCERATION OF THE GUMS.—Neil Macvicar describes a disease, called among the natives of East Central Africa, Chikusa, which is unpleasant and painful, although not dangerous to life. Ulceration begins at a spot on the alveolar margin of the gum, and in a few days spreads two inches or so along the gum. The ulcerated surface has an eaten-out appearance, discharges dirty pus and is speckled with blood clots. The roots of the teeth become exposed and the teeth loosened. The disease lasts for weeks. The cause is probably a specific microorganism, whose nature is as yet unknown. Many patients are well nourished and cleanly in the care of their teeth. A moderately strong solution of the permanganate of potash used as a wash, or applied with a camel's hair brush half a dozen times a day or more, will, in a few days, cure even the worst cases.—*Jour. Tropical Med.*

MARRIED.—W. J. Barnaby, Cedar Rapids, Ia.; Lulu Keys, Atwater, O., Nov. 19.—E. T. Evans, Decatur, Ill.; Grace Radcliffe, Frederick, Md., Nov. 12.—Guy Fraker, Shelbyville, Ill.; Neva French, Shelbyville, Nov. 27.—C. C. Harris, Providence, R. I.; Gertrude Harris, Norwich, Conn., Nov. 25.—F. B. Holcomb, Cherry Creek, N. Y.; Blanch M. Curtiss, Cherry Creek, Dec. 17.—H. P. Hopkins, Little Rock, Ark.; Nora C. West, Clarendon, Ark., Dec. 4.—J. W. Lawrence, La Crosse, Wis.; Jessie P. Bailey, La Crosse, Dec. 11.—P. W. Lenze, St. Louis; Emma Steinbach, Quincy, Ill., Dec. 3.—Charles Malson, Whitesboro, N. Y.; Bessie Teller, New York City, Dec. 2.—G. V. Milholland, Baltimore; Ella C. Gordon, Baltimore, Nov. 19.—E. C. Stowell, Ossian, Ind.; Louise Walsh, Valparaiso, Dec. 4.—L. A. Wood, Loraine, O.; Edith Wood, Elyria, Dec. 10.—H. M. Whitby, Houston, Tex.; ———, Nashville, Tenn., Dec. 10.

SUPRAORBITAL REFLEX.—D. J. McCarthy states that the upper part of the face is richly supplied with sensory nerve filaments from the fifth nerve, all of which are accessible to mechanical or sensory irritation. A careful study of the reflexes in this area will show that there are several independent and distinct reflexes, as follows: (1) A pure sensori-motor reflex, in the nature of a skin-muscle reflex, elicited from the supraorbital distribution exclusively; (2) A periosteal reflex may be obtained when there is an excited condition of the reflexes, by irritation (percussion) over the malar arch or the periosteum of the nose (v. Bechterew, Overend); (3) The corneal and conjunctival reflexes may be obtained by irritation of these structures; (4) The cor-

neomandibular reflex of v. Solder is a lateral movement of the lower jaw, produced by irritation of the cornea.—*Phila. Med. Jour.*

DAMAGE SUITS.—Last June a woman in Toronto had twelve teeth extracted. Soon after she became ill with bronchial pneumonia, and in July coughed up a tooth. She recently sued the dentist for $200 damages, but he denied that he pulled the tooth in question, and stated that it was out when the woman first came to him. The jury held him blameless.—A dentist in Racine recently sued a man to recover a balance due of $50 for services. The patient brought in a counter claim for $175, but the jury found for the dentist, and the court ordered the patient to pay the bill and stand the costs in the case.—A woman in Rochester recently sued a dental parlor for $100 damages. She went there to have some teeth extracted, and the operator gave her "vitalized air." She claimed that it made her so sick that she spoiled a new silk dress, and that her jaw was injured. The court, however, decided that the dentist was not to blame.—A woman in Syracuse, N. Y., has sued a dentist for $500 damages, alleging that when extracting a tooth he did not do the work properly and that he was not licensed to practice.

TONGUE IN ACUTE MALARIAL INFECTION.—Lucien Loften calls attention to the fact that in acute malarial infection the tongue exhibits one or two (generally two) dark lines, running from the base of the organ to the apex, and usually separated by a clearly defined tract of clean mucous membrane about one-sixteenth to one-eighth of an inch wide. These lines are pyramidal in appearance, and begin among the large papillæ at the base of the tongue. They vary in width, and may be from one-eighth to one-quarter of an inch wide, gradually coming to a point in the middle of the tongue. In color they resemble the stain of a 10 per cent solution of potassium permanganate that has been exposed to the air for some time. They are quite different from the discoloration seen in users of tobacco and snuff, and, when once carefully noted, are thereafter easily recognized. This condition will most likely be found from one day to two weeks after exposure or inoculation. It remains in some individuals longer than in others, notably in the negro. It is more beautifully defined from six to twelve hours after the initial sporulation, and remains until the system is thoroughly cinchonized.—*N. Y. Med. Jour.*

HUMAN INCUBATOR.—A Kentucky farmer, Filson by name, lay sick with a fever so high, the account goes (*Popular Mechanics*), that it notably heated the whole bed coverings. He was the breadwinner of the family, but his wife was a resourceful woman. Seeing her husband's energies going altogether to waste in uselessly raising the local temperature of his immediate surroundings, the thought occurred to her of a way of utilizing them to her and her family's profit. Borrowing some four dozen eggs she placed them in the bed, securing them from danger of breakage by some simple arrangement, and in due time hatched out in this novel incubator, 44 chickens, to the great delight of the father of the family and herself. Perhaps the emotional condition influenced the disordered heat centers, for it is said with the appearance of the newly hatched brood the fever subsided, at least this is an allowable *post hoc* conjecture. Continued fever is not a pleasant matter,

as a rule, but the woman of the above story, which is given as a veritable history, deserves credit for her ingenious utilization of adversity and the conclusion certainly is cheerful. Father and chickens are reported as crowing over their outcome.

SALIVARY SECRETION IN NERVOUS DISEASES.—A. Acquaderni reaches the following conclusions: Sialorrhea is found in many nervous affections, and is a symptom to be classed with polyuria, glycosuria, and icterus. It is produced either by direct irritation of the salivary center (affection of the medulla), or by abolition of the cerebral moderating influence, or stimulation of the secretory tracts of the hemispheres (softening hemorrhages), or reflexly through some lesion irritating the sensory nerves (neuritis—tic douleureux). In central paralysis of the facial nerve the salivary secretion of the affected side does not appear to be modified, and in no case is it diminished, but if anything increased. In peripheric facial paralysis there is diminution or abolition of the secretion, according to the severity of the lesion. Prognosis of sialorrhea depends upon the affection in which it occurs; in some it indicates the progress of the disease, and in the absence of other bulbar symptoms indicates involvement of the medulla (labio-glossal laryngeal paralysis, tâbes, anyotrophic lateral sclerosis). Persistent and prolonged sialorrhea may, independently of the disease causing it, considerably aggravate the bad condition of the patient.—*Rivista Critica di Clinica Medica.*

SURGICAL ASEPSIS AND ANTISEPSIS.—With the view of determining the value of antiseptics in surgical work, and to what extent asepsis of the operative site and wound could be obtained, Gangitano (*La Riforma Médica*) made a series of experiments, with the following findings: (1) The skin cannot be made absolutely sterile, as the deeper strata remain septic, despite all aseptic and antiseptic measures. (2) A pack of soft soap or a one per cent solution of formalin applied the day before operation renders the superficial skin sterile in 30 per cent of all cases. Bichlorid produces sterility but once in ten times. (3) Sutures become infected in their passage through the deeper layers of the cutaneous tissue, as shown by cultures from sutures passed through skin which is superficially sterile. (4) The path of a suture may be sterilized by passing the needle which carries the thread through a flame immediately before the stitch is taken. A fine needle should be used, and introduced rapidly; a coarse needle, slowly introduced, produces injury to the tissues. A fresh needle and suture for each stitch are essential to the success of this method. (5) Cultures from wet dressings show presence of bacteria which live only in moist surroundings; a dry dressing is to be preferred.—*Medical News.*

REFLEX VALUE OF WORK WITH THE MICROSCOPE.—There is nothing, I believe, quite equal to work over the microscope for sharpening one's critical faculties as brought to bear upon almost every department of our professional labors. The degree of the perfection of our work depends upon two prime conditions; the acuteness of our perception as to what is really needed in the adaptation of means to ends, and the ability to put into execu-

tion the ideal formed in the mind. Work with the microscope is certain to very greatly enlarge and improve the first of these conditions; and when the critical faculty is keen and alert, when the ideal of an enlarged vision becomes fixed on a high plane, the fingers will slowly respond to this ideal almost unconsciously. Take an extracted tooth and prepare a cavity in it. Fill the cavity with gold and finish in your usual manner. Now examine your work with a magnifying power of from twenty-five to fifty diameters. You will be impressed, as you never have been before, with the merely relative nature of the perfection of your work. You will see numberless grooves and crevices where the microorganisms causing decay may possibly find lodgment and thus begin anew their work of destruction. The knowledge thus gained will, as I have said, almost involuntarily work itself out in the fingertips, and your operations will reach a higher level of perfection.—J. LEON WILLIAMS.

SOLUBLE MATRIX.—W. W. BELCHER: I have been using for the past year a new matrix of my own devising. It has a limited application, but fills a place impossible with any other. In the use of the removable band matrix it has always been my fear that while in a plastic condition the filling might become disturbed at the cervical margin; and it occurred to me that a matrix which could be quickly applied, and the necessity of its removal obviated, would prove most desirable. This matrix is of thin gelatin, which can be procured in sheet form, or better still, as the ordinary 1 dram veterinary capsule. Gelatin is eminently soluble. On the application of moisture it can be shaped to any form. It possesses in a large degree several of the essentials of a matrix; ease of manipulation, non-irritability or injury to the tissues, and properly shaped, will not obscure the cavity. Taking a sheet of gelatin or a veterinary capsule it is held in the hand for a few moments to impart warmth and then shaped for the case in hand. The matrix is placed in position, the tooth filled, with no further attention to the matrix, as the saliva will in a short time remove all traces of it, with no risk of disturbance of the filling. Five years ago I rarely used matrices, but each day I find a new application for them, an increased satisfaction in my work; best of all a feeling of having rendered superior service and collected a fee in accordance therewith.—*Off. and Lab.*

HEMORRHAGE AFTER REMOVAL OF ADENOIDS.—Louine (*Phila. Med. Jour.*) reports five cases of severe hemorrhage following the removal of the nasopharyngeal gland in children from six to fourteen years old. In considering the causes of hemorrhage the author mentions (1) hemophilia and anemia; (2) heart disease, especially hypertrophy of the left ventricle; (3) anomalies in the nasopharynx, especially the so-called vertebra prominens; (4) the anomaly of the posterio inferior border of the septum described by Grunwald under the name of ala septi; (5) anomalies in the distribution of the blood vessels; (6) the employment of cocain, which acts first as a vasoconstrictor and then as a vasodilator; (7) a piece of the gland which remains attached by the mucous membrane only and acts as a foreign body; (8) menstruation; (9) very sharp instruments; (10) acute catarrhal condi-

tion of the upper respiratory passages accompanied by engorgement of the blood-vessels. As to treatment, the hemorrhage, if not very severe, may be controlled by the usual methods, such as injection of cold or hot water, insufflation of tannin, application of trichloracetic acid, ferropyrin, extract of suprarenal gland, getol, dermatol, etc. The author found in ferropyrin an excellent hemostatic in slight hemorrhages, used in a five-per-cent solution of gelatin. If no success follows the application of the above methods, tamponage should be resorted to, but only as a last resort, and with great caution in the case of small children, as in them the tampon causes obstruction of deglutition and breathing and may lead to complications in the ear. As a preventive against subsequent hemorrhage, complete rest for several days after the operation should be insisted upon.

FIBRO-SARCOMA OF SOFT PALATE AND TONSIL.—Dr. C. M. Robertson narrated the case of a farmer, aged 62, who, while picking his teeth with a straw, pricked the left tonsil, causing only slight pain. In a few days he noticed a small swelling above the left tonsil, which increased rapidly in size till the end of eight weeks, when he presented himself for relief. At this time the patient experienced great difficulty in breathing, and it was almost impossible to swallow food. Upon examination, a large tumor was found occupying the left palatal arch, well down to its base, involving the tonsil and side of the pharynx as far as the epiglottis, and up behind the edge of the hard palate as far as the left Eustachian tube. It extended forward into the mouth to within one inch of the incisor teeth. The growth was smooth in contour, lighter in color than the surrounding tissues, and firm and elastic to the touch. Under cocain a piece of the growth was removed for microscopic examination and pronounced fibro-sarcoma. The following week the growth was removed under chloroform anesthesia. It was found to be encapsulated, and on this account a favorable prognosis was made. In looking over the literature I find some 25 cases reported of sarcoma of the soft palate and 45 additional cases of sarcoma, where the soft palate and tonsil or tonsil alone were involved. In nearly all the cases the growth was removed by external operation, and in these cases recurrence was frequent, whereas the encapsulated growths removed by the mouth were not so prone to recurrence. The case under consideration has as yet shown no signs of new growth, twenty months having elapsed, and therefore I feel justified in reporting it as a cure.

Dr. E. F. Ingals recalled the case of a boy of 13, upon whom he operated and removed a fibro-sarcoma in 1883, through the natural passages. The tumor soon showed a tendency to recurrence, but as the patient was in the city alone and fell into bad company, I was obliged to send him to his home in a distant state. He came to see me again sixteen years afterward for pain in the chest, apparently of rheumatic origin. He stated that after returning to his home the first time the tumor had grown so as to cause complete nasal obstruction, and great prominence of the right cheek, and to destroy sight in right eye, but after a few years it had almost completely disappeared by atrophy.—*Jour. A. M. A.*

A D. D. S. EPITAPH.

A worthy dentist rests beneath
This high-heaped, grassy mound;
True man was he, although his teeth
Full often false were found.

All obstacles he did despise,
And often would he brag,
He rather liked, than otherwise,
To run against a snag.

Much suffering did he assauge,
His patients lost each pang,
Though erst the throbbing tooth might rage,
As they his door bell rang.

His speech was frequent and most free,
Right seldom would he pause,
Although a masterhand was he
At holding others' jaws.

He owned no family or clan,
But gave all satisfaction,
For all agreed he was a man
Of excellent extraction.

He died without a sob or groan,
He lived in decent gravity,
And now, beneath this mossy stone,
He's filling his last cavity.
(*Copied by Dr. F. C. Barlow, Jersey City, from an old scrap-book.*)

Tic Douloureux. By Chipault and A. F. Plicque.—Static electricity seems to have a special action in hysteric tic douloureux, but isolation usually proves the most effectual of all measures in these cases. Potassium bromid is useless in epileptiform tic douloureux, but is sometimes beneficial in cases associated with true epilepsy. Several remarkable cures of this kind have recently been published. Strontium bromid seems to be even more effectual. The bromid must be pure, free from all traces of baryta. Total peripheral resection of the nerve involved has resulted in some cures without recurrence for years, but in case of a primary or secondary "Gasseritis" peripheral resection is, of course, useless. When the pain is in the deep-seated portions of the nerves, the Gasserian ganglion should be resected without wasting

time on peripheral measures. Resection of the superior ganglion of the sympathetic is a benign intervention and is proving very effective. Recurrence is liable at first, but the recurrence is much less severe and is liable to yield to therapeutic measures previously quite ineffectual. Resection of the ganglion has a vasomotor influence on the Gasserian ganglion and also on the peripheral branches and bulbar centers of the trigeminal. The harmlessness of this operation and its far-reaching influence promise a future for it in the treatment of certain facial neuralgias.—*Presse. Med.*

RECOVERY FOR PHYSICAL INJURIES CAUSED BY FRIGHT.—The Supreme Court of Iowa says, in the case of Watson vs. Dilts, that many cases have been before the courts in which the question of a recovery for mental pain alone, and for physical disability produced by fright, unaccompanied by physical impact, have been decided; and the decisions on these questions are in conflict, though it is probably true that the numerical weight of authority denies the right of action. But the cases so holding are not in harmony as to the reasons given for denying the right of action; some of them hold that the injury is not the proximate result of the alleged negligent or wrongful act, while others refuse a recovery for the reason that it is practically impossible to satisfactorily administer any other rule and serve the purposes of justice. A large majority of the cases which hold to the doctrine that no recovery can be had are cases in which the simple charge of negligence was made, and in many of them no claim was made for physical disability resulting from the fright. In this case, the person sued for damages stealthily invaded the home of the party suing in the night time. When he entered and went to an upper room, she did not know who it was, nor his purpose and intent in thus breaking in. She called to her husband to follow him, which he did; and, in her apprehension of danger, she followed her husband up to a room, where she found them in what appeared to be an encounter, and an assault upon her husband. From her great fright thereat, she averred that her nervous system completely gave way, and that she suffered physical injuries from the fright. The court says that its attention has not been called to any case where the facts averred precisely paralleled those in this case, nor has it discovered anywhere the facts alleged so strongly condemn the unlimited rule contended for that no recovery can be had for physical injuries caused by fright. The object of the invasion of the home in such manner was immaterial. Suppose that the object was to ransack the house, and steal therefrom; that the man went in masked, and with a deadly weapon in his hand. His discovery there under such circumstances might well cause alarm for the boldest man, and, if it produced nervous prostration and physical disability, the theory, no matter what its reason, that would say there was no actionable wrong, the court says, would be too fine spun and too cold for its sanction. Nor could it be said, under such circumstances, that the prostration resulting from the fright so caused was not the proximate or probable result of the party's act. It is within the common observation of all that fright may and usually does affect the nervous system, which is a distinctive part of the physical system, and controls the health to a very great extent, and that an entirely sound

body is never found with a diseased nervous organization; consequently, one who voluntarily causes a diseased condition of the latter must anticipate the consequence which follows it. The nerves being, as a matter of fact, a part of the physical system, if they are affected by fright to such an extent as to cause physical pain, it seems to the court that the injury resulting therefrom is the direct result of the act producing the fright. But each case must, of necessity, depend on its own facts.

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VOL. VIII. DECEMBER, 1902. No. 12.

The Dental Digest

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THE OFFICIAL ORGAN OF THE

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Dental Protective Association,
Missouri State Dental Association,
Wisconsin State Dental Society,
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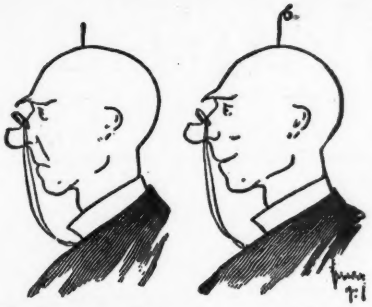

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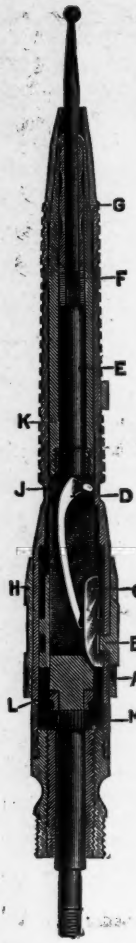


DIRECTIONS FOR USE

To fasten bur in handpiece—Push the sleeve H forward (which opens the split chuck G); insert the bur in spindle and draw back the sleeve H as far as it will go.

To oil handpiece—Unscrew the milled nut A (giving it about 4 turns), take out B, and then remove the sheath. Lubricate at back bearing L, and at coned portion of spindle for forward bearing and also on sliding collar C. Screw sheath back on collar, replace B in its seat on H (being very careful to see that the small lug on B engages in the groove of C) and screw milled nut A back in place.

To take up wear by tightening chuck—When because of wear bur is not held tightly, remove outside sleeve H and unscrew the sheath. By taking hold of front spindle K, where it is flat, and placing flat-sided instrument in slot of back spindle J, you can easily unscrew the two spindles. Take out the plunger E, and on small end place a copper washer. Assemble the handpiece, and if bur is not held tightly enough, remove parts as before and add another washer.

To attach handpiece to any engine arm—Push forward sliding sleeve H and place instrument in slot to hold spindle at back of handpiece from turning. Then screw driving spring in flexible wrist on to spindle by turning to left, and fasten flexible sleeve to handpiece.

Dental Protective Supply Company

1101-1104 Champlain Building, Chicago

Branch at 818 Real Estate Building, Philadelphia

There is Just as Much Difference

between a satisfactory and an unsatisfactory handpiece as there is between these two figures. You don't know what a comfort a handpiece can be unless you are using a "FELLOWSHIP." One of its best features is that it does not smear your hands and your patient's face with oil. All other handpieces do.

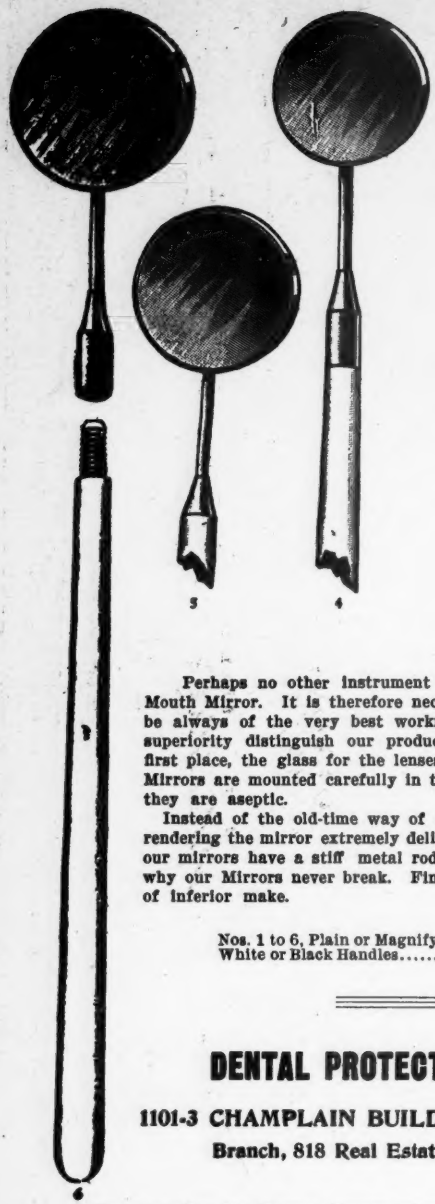
IT Has Lots of Other Good Qualities. There is not a screw in it, so it can be easily taken apart to oil and clean without wrench or screw-driver. It has long, efficient cone bearings, and we guarantee that if kept well oiled and cleaned the handpiece will outlast any other. The wear can be readily taken up from time to time; if repairs should be necessary, their cost, owing to its simple construction, will be about half as much as for other handpieces. It can be attached to any engine or slip-joint, will hold all burs except the "No. 6," and any angle attachment may be used with it.

PRICE, $10.00.

Just to introduce the "FELLOWSHIP" handpiece, we will allow $2 for your old one, so it and $8 ($7.20 if cash accompanies order) will bring you an eminently satisfactory instrument. Don't be annoyed one day longer when such an offer as this is open to you.

DENTAL PROTECTIVE SUPPLY CO.

1101-1104 Champlain Bldg., CHICAGO. Branch at 818 Real Estate Bldg., Philadelphia.



Guaranteed MOUTH MIRRORS

Perhaps no other instrument is used more constantly than the Mouth Mirror. It is therefore necessary that this instrument should be always of the very best workmanship. Two or three points of superiority distinguish our product from the general run. In the first place, the glass for the lenses is selected with great care. Our Mirrors are mounted carefully in their frames, and so far as possible they are aseptic.

Instead of the old-time way of cutting a thread upon the handle, rendering the mirror extremely delicate at the point of greatest strain, our mirrors have a stiff metal rod inserted in their handles. That's why our Mirrors never break. Finally, the price is lower than those of inferior make.

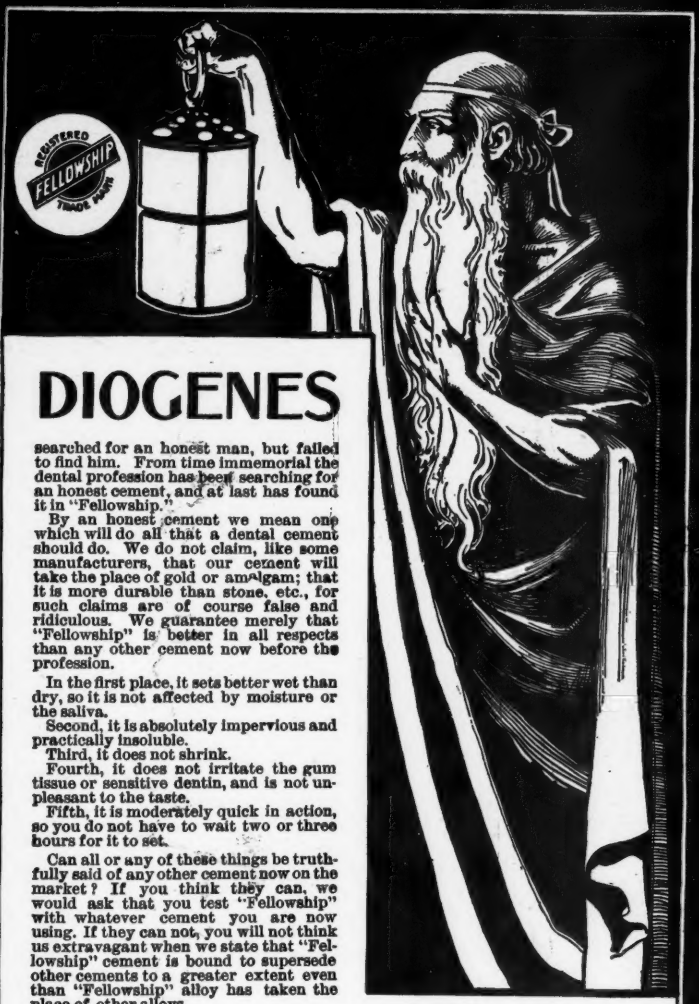
Nos. 1 to 6, Plain or Magnifying, White or Black Handles..... ***65c each***

DENTAL PROTECTIVE SUPPLY CO.

1101-3 CHAMPLAIN BUILDING :: CHICAGO

Branch, 818 Real Estate Bldg., Philadelphia.

Please mention the DENTAL DIGEST when writing to advertisers.



DIOGENES

searched for an honest man, but failed to find him. From time immemorial the dental profession has been searching for an honest cement, and at last has found it in "Fellowship."

By an honest cement we mean one which will do all that a dental cement should do. We do not claim, like some manufacturers, that our cement will take the place of gold or amalgam; that it is more durable than stone, etc., for such claims are of course false and ridiculous. We guarantee merely that "Fellowship" is better in all respects than any other cement now before the profession.

In the first place, it sets better wet than dry, so it is not affected by moisture or the saliva.

Second, it is absolutely impervious and practically insoluble.

Third, it does not shrink.

Fourth, it does not irritate the gum tissue or sensitive dentin, and is not unpleasant to the taste.

Fifth, it is moderately quick in action, so you do not have to wait two or three hours for it to set.

Can all or any of these things be truthfully said of any other cement now on the market? If you think they can, we would ask that you test "Fellowship" with whatever cement you are now using. If they can not, you will not think us extravagant when we state that "Fellowship" cement is bound to supersede other cements to a greater extent even than "Fellowship" alloy has taken the place of other alloys.

FELLOWSHIP CEMENT.

Price, per box, $1; Six boxes, $5.

Dental Protective Supply Co.

1101-1104 Champlain Building, Chicago.

Branch at 808 Real Estate Building, Philadelphia.

"FELLOWSHIP"

TWIST BROACHES

Fellowship TWIST BROACHES
have no barbs.

Fellowship TWIST BROACHES
are unbreakable.

Fellowship TWIST BROACHES
can be tied in a knot.

Fellowship TWIST BROACHES
are made of toughest steel known.

Fellowship TWIST BROACHES
are made to go into smaller canal than any barbed broach.

Fellowship TWIST BROACHES
are the best made.

Fellowship TWIST BROACHES
are the cheapest.

Fellowship TWIST BROACHES
are made in the following sizes:
Fine, Medium, Coarse, Assorted.

PRICES

Per Package, (1-2 dozen) . .	$ 0.50
Per Dozen	1.00
Per Six Dozen	5.50
Per Gross	10.00

MANUFACTURED ONLY BY

Dental Protective Supply Co.

1101-1104 Champlain Building, CHICAGO

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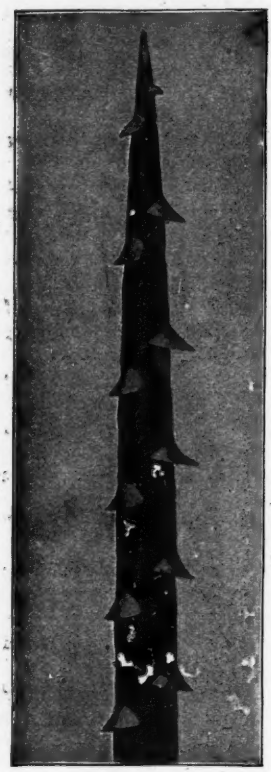
Please mention the Dental Digest when writing to advertisers.

"Fellowship" Nerve Broaches.

FELLOWSHIP



BROACH.

This cut is made from a micro-photograph of a **"Fellowship" Broach,** showing it enlarged about twenty-five times.

"Fellowship" Broaches are made from the finest spring-tempered steel and are barbed on three sides only, which makes them stronger and less liable to break than the Donaldson and similar broaches, which are barbed on four sides.

"Fellowship" Broaches are made by skilled workmen and every instrument is tested before leaving the factory.

"Fellowship" Broaches were the first of superior quality offered the dental profession at a reasonable price, and are now, as then, **the peers of any broaches at any price.**

Any supply house can make a fair profit retailing broaches at $1.00 per dozen. We suggest that you ask the Trust houses why they have charged outrageous prices all these years.

"Fellowship" Broaches are put up in five styles—extra fine, fine, medium, coarse, assorted—and they sell for $1.00 per dozen, $5.50 per half gross, $10.00 per gross.

Since we have made it possible for you to buy broaches at a reasonable figure, do we not merit your trade in this line? Insist on having "Fellowship" Broaches. If your dealer can't or won't supply you, send to us.

Dental Protective Supply Co.

1101-4 Champlain Bldg., Chicago.

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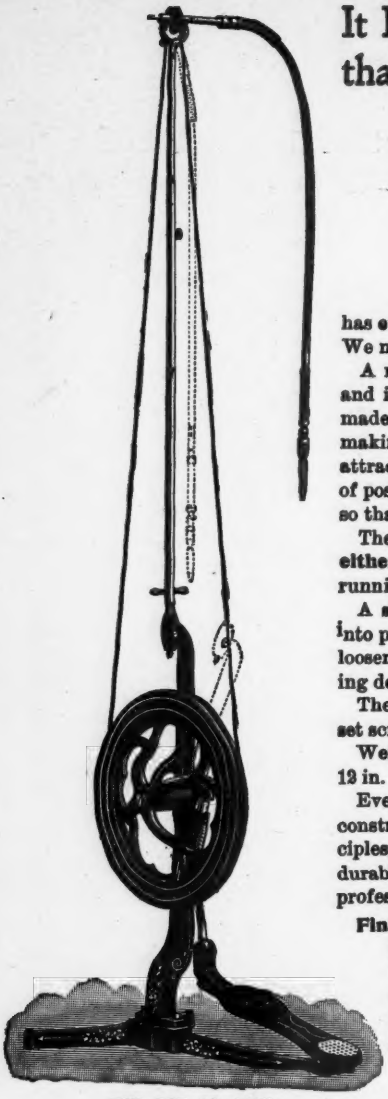


PAT. OCT. 12, 1895

It Is Not An Accident that the

"Fellowship" Engine

has every engine virtue and no engine faults. We make it so.

A new lot of 500 has just been completed, and in them a few improvements have been made, such as the dish-shaped wheel, etc., making this engine the most artistic and attractive in appearance of any. All points of possible weakness have been strengthened, so that breakage is almost impossible.

The drop pulley-head has long bearings on either side of the wheel, which insure steady running and equal wear at all points.

A slight upward toss of the arm raises it into position, and pressure on the thumb-piece loosens it. This is the most convenient locking device on the market.

The standard can be raised or lowered by set screw.

Weight of driving wheel, 13 lbs.; diameter 12 in.

Every feature of the "Fellowship" engine is constructed upon correct mechanical principles, and it is the easiest running and most durable article of the kind yet offered to the profession.

Finally, the price is lower than that asked for inferior engines. We offer the "Fellowship" equipped with our universal handpiece, 14 instruments, oil can, flexible sleeve and engine arm support for

$37.00

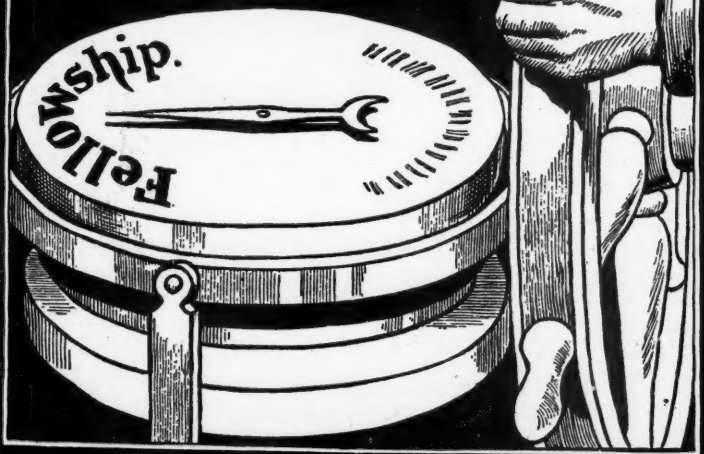
Dental Protective Supply Co.

1101 Champlain Building, Chicago.
BRANCH, 818 REAL ESTATE BLDG., PHILADELPHIA.

DEPENDABLE

"About two years ago someone introduced an imitation of the original Fellowship alloy, and they thought at first it was just as good as the Fellowship. A number of us took it up. It was somewhat cheaper, something new, so we started to use it, and instead of getting hard, it proved a difficult-setting amalgam; it would get hard enough to polish, but in the course of a few days one could take an excavator and cut it out. I do not know whether that was due to the amount of zinc in the alloy, or what it was, but IT TAUGHT A GOOD MANY OF US A LESSON ABOUT GOING IN DIVERSE WAYS AND USING AMALGAM WE DID NOT KNOW ANYTHING ABOUT."—*Dr. H. B. Hickman in Transactions of the Philadelphia Academy of Stomatology.*

Ad. p. 23 will tell you all about the "dependable" alloy.



"FELLOWSHIP"

Right Angle Mallet

Invented by DR. S. G. PERRY, New York

This mallet is one of the simplest, strongest and most attractive instruments **for packing gold** ever offered to the dental profession. The bearings are long and efficient, the hammer having bearings on either side. The plugger points are inserted without the use of special pliers or long tapers, and it merely requires a slight pressure on the spring to release the point.

The **rapidity** of blow is regulated by the speed of the engine, and every revolution of the handpiece gives a blow.

The **force** of blow is regulated by the pressure brought to bear on the tooth.

The mallet can be attached to any handpiece.

Price of Right Angle Mallet, $6.00

Price per set of six plugger points (assorted), $2.00.

Dental Protective Supply Co.

1101-1104 CHAMPLAIN BUILDING, CHICAGO.

Branch at 818 Real Estate Building, Philadelphia.

Four Points

wherein our "FELLOWSHIP" slip-joint is superior to all others:

First—It is universal and will fit any handpiece.

Second—The locking device is simplicity itself and there is no cumbersome catch to hinder and annoy you.

Third—It is cheaper. Price complete (parts A, B, C), **$6.50**. Extra Sheath (A), **75** cents. Extra dog (C), **25** cents.

Fourth—It will last a lifetime, as the wear can be taken up. All other slip-joints might as well be thrown away when they start to wobble, but in ours the wear can be taken up. Notice the cone bearings at D, a feature possessed by ours alone.

DENTAL PROTECTIVE SUPPLY CO.

1101-3 Champlain Building,
CHICAGO.

Branch 818 Real Estate Bldg., Philadelphia.

We Bind Our Patrons to Us

By giving them prompt, careful and honest service, reliable goods, and right prices.

Since entering the field we have forced an improvement in quality and a lowering in price of most dental supplies, notable examples of which are alloy, broaches, cement, teeth, etc.

We now offer **a discount of 10 per cent for cash** on all purchases, excepting precious metals and Trust goods, which is more than any other house allows.

We are the leaders in mail order service, and have convinced the profession that this method of buying goods is not only the cheapest but the most satisfactory.

Others are pleased—may we please you. A trial order will bind us together.

Dental Protective Supply Co.

Manufacturers of "Fellowship" Specialties and Dealers in Dental Supplies.

CHICAGO AND PHILADELPHIA.

At the Top of the List

OF ALLOYS OF THAT CLASS IS

"DUCTILE"

Do not use something which is no better now than it was thirty years ago. The alloy revolution came in 1897, and it was shown at that time that there was not one on the market fit to use.

There are to-day two kinds of alloys in use—one, quick setting, rich in silver—so hard-working and not plastic. In this class "Fellowship" stands supreme.

The other class comprises those alloys which are termed slow-setting, easy-working and plastic. Most of these latter are utterly unreliable, as they shrink badly and wear away rapidly.

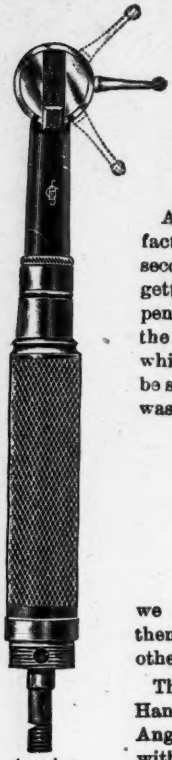
We have, however, perfected an alloy in "Ductile" which does not have these faults. It amalgamates readily and works easily, sets slowly, does not shrink, resists the wear of mastication and retains a good color. We guarantee it to be superior to all other plastic alloys, and can heartily recommend its use to practitioners seeking this kind of a filling material. "Ductile" is not so good as "Fellowship," but it is far and away ahead of any other $1.50 or $2.00 alloy yet offered for sale.

DENTAL PROTECTIVE SUPPLY COMPANY,

1101-1104 Champlain Bldg., Chicago.
Branch at 818 Real Estate Bldg., Philadelphia.

DUCTILE ALLOY
is $1.50 per ounce.

Five ounces, . .	$ 7.00
Ten ounces, . .	13.00
Twenty ounces, .	24.00



Angular Handpiece.

SATISFACTORY INSTRUMENTS

At present angular handpieces are not satisfactory; first, because the price is too high, and second, because they are continually breaking or getting out of order, thus causing frequent expense and trouble. The trouble has come from the fact that the proper combination of gears, which would give all the required angles and yet be strong enough to withstand the great strain, was not found. In our

"Fellowship" Angle Attachment and Angular Handpiece

we have solved the problem, and guarantee them to require less repair and to outwear any others on the market.

The Angle can be attached to our "Fellowship" Handpiece, or to the "No. 6" or "No. 7"; and the Angular Handpiece can be used with our own or with any standard slip-joint.

The bur can be held at either an acute, right or obtuse angle, thus giving all desirable positions.

Angle Attachment.

Bur for both Instruments.

These instruments take a bur with groove in shank by which it is held. If you have a stock of "No. 2" angle or of Davis burs on hand, we will, **without charge**, fit them to our angle.

PRICES:

Angle Attachment,	**$7.00**
Angular Handpiece,	**7.50**
Burs, per dozen,	**1.00**

Dental Protective Supply Co.

1101 Champlain Building, Chicago.

BRANCH 818 REAL ESTATE BLDG., PHILADELPHIA.

Please mention the Dental Digest when writing to advertisers.

THE "FELLOWSHIP"

CONE JOURNAL LATHE

has all the good points possessed by others now on the market, and in addition has two special features peculiar to itself, namely,

Dust-Proof Cone Bearings and Self-Truing Chucks.

The spindle has cone journals, the right fixed, and the left movable, so that the wear may be readily taken up. There is a jamb nut to tighten the movable cone when properly adjusted, and to prevent it from coming loose.

The lathe is also provided with dust-proof caps, which prevent the grit from carborundum and other abrasives from destroying the bearings. The lack of such protection is what causes other lathes to wear and become wobbly in a short time.

The chucks are self-truing. The hole in them is conical, and when screwed on shaft they jam themselves against a cone of the same taper, so that they must true themselves.

Besides giving better satisfaction, and being cheaper, the "Fellowship" lathe will outwear any other.

PRICE, WITH 5 CHUCKS, $7.00

DENTAL PROTECTIVE SUPPLY CO.,

1101-1104 Champlain Bldg., CHICAGO.

Branch at 818 Real Estate Building, Philadelphia.

BETTER, CHEAPER, SIMPLER.

IN manufacturing the "Fellowship" automatic mallet we have endeavored to avoid all defects existing in other mallets. The construction is simplicity itself, the direct and pull strokes being governed by the same mechanism. All the working parts are carried by the spindle, which reduces the friction. All those parts subject to wear are made of hardened steel. The workmanship throughout is the very best. The mallet gives a uniformly dead blow, the force of which may be varied to suit the needs or wishes of the operator. The adjustment to regulate this is made by turning a knurled thimble at one end.

Both ends are drilled to hold either the cone socket or automatic plugger points. The "grip" on either end is covered with black hard rubber.

Despite the fact that this instrument is equal to all and superior to most mallets now in the market, the price is as low as any and lower than most.

Price, Double Action - - - $6.00

Dental Protective Supply Co.

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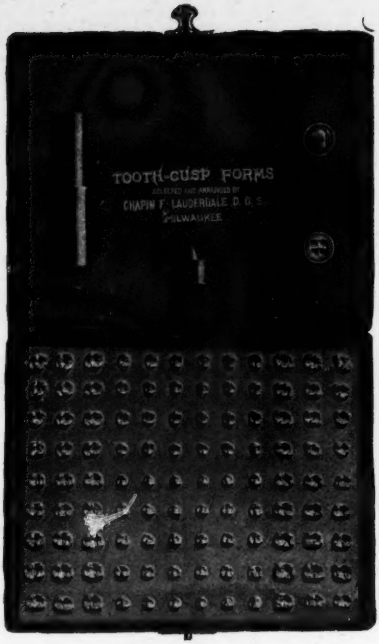

PATENT APPLIED FOR.

The Lauderdale Selection of Tooth-Cusp Forms and Swaging Device

is effective and easily operated.

By this method a cusp can be produced that articulates properly and adapts perfectly to the band.

A crown can be completed at one sitting.

The outfit is of material advantage in the following:

Backing Porcelain Teeth.
Swaging Gold Dummies.
Swaging Open-Faced Crowns.
Swaging Shell Crowns for any tooth in the mouth, either normal or badly decayed.

Price complete with printed instructions, $10.00.
Send for booklet.

C. F. LAUDERDALE,
128 Wisconsin Street,
MILWAUKEE, WIS.

Registered. Actual Size.

PUSTOLENE.

PUSTOLENE is a root canal treatment and filling combined in one.

PUSTOLENE will positively cure any case of chronic abscess at one sitting.

PUSTOLENE has been in use over 5 years and has been thoroughly tested.

PUSTOLENE unlike other fillings will not dry up and become hard.

PUSTOLENE has no equal for capping exposed pulps. Testimonials furnished. Satisfaction guaranteed. **Price, $1.**

Address J. A. SPRAGUE & CO.,
189 E. Lincoln St., Columbus, O.

For sale by Dental Protective Supply Co.

PATENTS

Quickly secured. OUR FEE DUE WHEN PATENT OBTAINED. Send model, sketch or photo. with description for free report as to patentability. 48-PAGE HAND-BOOK FREE. Contains references and full information. WRITE FOR COPY OF OUR SPECIAL OFFER. It is the most liberal proposition ever made by a patent attorney, and EVERY INVENTOR SHOULD READ IT before applying for patent. Address:

H. B. WILLSON & CO.
PATENT LAWYERS,
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Don't Keep Your Scrap at Home

BUT MAKE IT PRODUCTIVE

By sending it in to us for cash or in exchange for goods. We pay the highest market price for amalgam scrap, gold scrap, filings and fillings, platinum scrap and platinum pins. SEND IT NOW.

Dental Protective Supply Co.

PHILADELPHIA, 818 Real Estate Bldg.
CHICAGO, 1101-4 Champlain Bldg.

Wants, For Sale, Etc.

FOR SALE Wishing to retire, I will sell a first-class practice, doing a cash business of **sixteen thousand dollars** per year. Who wants a fine opportunity? All improvements. References. Address "Successful," care DENTAL DIGEST.

WANTED Good operator holding Swiss Federal Dental Diploma, or one who secured his Cantonial Diploma by examination, can hear of an exceptional opportunity by addressing me.

All-round man for Cape Colony, South Africa, two years' contract. Second-class passage paid out from New York. State salary expected.

Exceptional opening in South American city for a good porcelain and crown and bridge worker. Good salary. Two years' contract and renewal if satisfactory.

Practices for sale. Positions. Send for complete list.
CHAS. R. HAMBLY, Official Broker, Bradford, Pa., U. S. A.

WANTED A location in Kansas, Oklahoma or Southwest Missouri. Address "No. 40," care DENTAL DIGEST, 2231 Prairie Ave., Chicago.

FOR SALE One of the best equipped offices in the West, with practice of over six thousand dollars a year. Price, $5,000, one-half cash. Reason for selling, desire to go South on account of health. Address "M," care Marshall Dental Mfg. Co., Des Moines, Ia.

WANTED Location and practice. Address Drawer 1026, Peoria, Ill.

WANTED Skillful assistant dentist. Gentleman or lady. Address WINFIELD LUSK, Merrill, Wis.

FOR SALE A $2,400 cash practice in a Northern Michigan mining town of 4,000 population. No opposition. Office strictly up to date. Practice can be increased by good man, as I have been here only a year and business is growing. Address "Michigan," care DENTAL DIGEST.

WANTED Dentists to make their wants known in THE DIGEST. Costs but five cents a word or initial. Strictly cash with order.

FOR SALE Space in this department for dentists who want to buy or sell practices; engage assistants; sell or exchange instruments, or make their wants known generally. It costs but five cents per word or initial. Please send cash with your order. DENTAL DIGEST, 2231 Prairie Ave., Chicago.

Please mention the DENTAL DIGEST when writing to advertisers.

when we perfected "Fellowship," the dentists of this country and Europe have had a thoroughly reliable alloy. Previous to that time there was not one on the market fit to put into the mouth, as the manufacturers did not care to incur the trouble and expense necessary to produce a reliable article. Consequently, conscientious dentists gave up the use of amalgam. "Fellowship," however, convinced them that there was such a thing as a trustworthy alloy.

We were the first manufacturers who tried to give you an honest article, and "Fellowship" was the first tested alloy ever put on the market. It to-day stands without a rival despite the attempts of our numerous imitators. *"Fellowship" quality is and always has been the standard by which all other alloys are measured.* We shall ever aim to keep it in that enviable position, and you need have no fear of it ever deteriorating.

"Fellowship" is at the top of its class because—it never shrinks, blackens the hand, nor discolors the teeth. It possesses great edge strength and density, so will stand a stress of mastication which no other alloy can. It sets quickly enough that the filling can be finished at one sitting. Most important of all, it is always uniform, as Dr. J. N. Crouse personally makes three tests from each batch, and guarantees it to be perfect before it leaves our factory.

"Fellowship" is now furnished in three styles—quick, slow and medium setting, the last always being supplied unless otherwise specified. The quality of all three is the same.

Beware of imitations, as there is only one "Fellowship" alloy and it is never sold except under our name. Beware also of any dealer who offers you "Fellowship" at one cent less than our prices, for he is trying to palm off some spurious substitute. The following are the only prices on

FELLOWSHIP ALLOY.

$3.00 per ounce.	$40.00 per twenty ounces.
12.50 per five ounces.	90.00 per fifty ounces.
22.50 per ten ounces.	170.00 per one hundred ozs.

REGISTERED FELLOWSHIP TRADE MARK

DENTAL PROTECTIVE SUPPLY CO.

1101-1104 Champlain Bldg., Chicago.

Branch at 818 Real Estate Bldg., Philadelphia

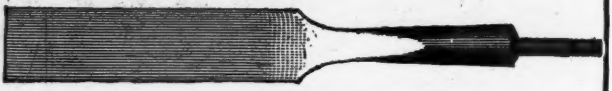
REGISTERED FELLOWSHIP TRADE MARK

A Good Cement Spatula

HAS PREVIOUSLY BEEN AN UNKNOWN QUANTITY,

As none was efficient and most of them corroded and discolored the cement. After several experiments Dr. Crouse has devised a spatula of specially tempered and treated steel, which is not affected by the cement acid, and will not discolor the mix. The shape is such as to guarantee thorough spatulation, which all cements require, "Fellowship" especially.

Price, cone socket .....50 cents
With special hard rubber handle.....75 cents



ACCURACY, CONVENIENCE AND ECONOMY

are effected by the dropper and tube which are supplied without extra charge in every box of "Fellowship" cement. The dropper enables you to take out the liquid neatly and accurately, serves as a cork, and does away with the "smearing up" common to the handling of cement. The measuring tube enables you to obtain the exact proportions of powder for a given number of drops. Full directions with each package. There is absolutely no waste when these two conveniences are used, so your cement bill will not be more than half what it has been formerly.

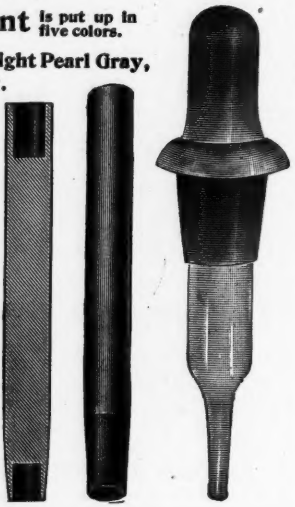
"Fellowship" Cement is put up in five colors.

White, Light Yellow, Yellow, Light Pearl Gray, Pearl Gray, Blue Gray.

Other colors on demand.

Price, $1.00 per box.
One liquid and one powder.

$5.00 for 6 boxes.
Extra liquid or powder, each 50 cts.



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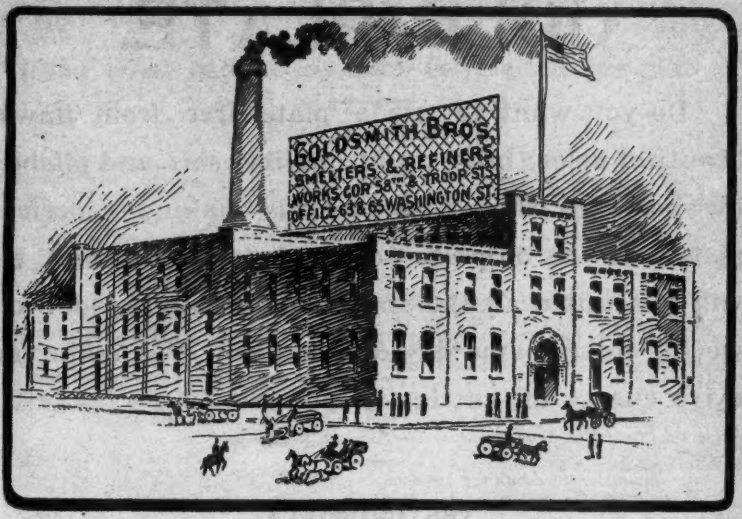

ESTABLISHED 1867.

GOLDSMITH BROS.

Smelters and Refiners

Manufacturers of Dental Specialties

Bullion Bought and Sold

Office: 63 and 65 Washington St., Chicago, Ill.

Works: Cor. Throop and Fifty-eighth Streets.

New York Office: 29 West Forty-second Street.

GOLD PLATE.

Do you want to use a plate free from flaws, beautiful color, fully up in quality, soft and pliable, in short, all that goes towards making a perfect plate? If you do place your order with us and we will guarantee all the above qualities. In addition we fill orders same day as received. We make no extra charge for cutting to pattern.

TESTIMONIALS.

Dawson, Ga.

Goldsmith Bros., Chicago.

Gentlemen:—Enclosed find check of $15.00, for which please send $10.00 worth gold plate, 22 k., balance in solder, 18 k. Have been using your gold and like it very much. T. H. Thurmond.

Princeton, Ind.

Goldsmith Bros., Chicago.

Gents:—I enclose some gold scrap to be returned in heavy plate, except two or three dollars' worth, which I would like to have in clasp metal. I was delighted with the last lot of plate. S. F. Gilmore.

Kingston, Ont., Can.

Goldsmith Bros.

Dear Sirs:—Goods arrived this a. m., thanks for promptness. The gold plate was beautiful. R. E. Sparks.

Holden, Mo.

Goldsmith Bros.

Gentlemen:—I send some 22 k. scrap fillings and bench filings in exchange for a piece of 34-gauge platinum, an inch square, and the rest in 22 k. 32-gauge plate gold.

Johnson & Johnson.

P. S.—We get more and better gold from you in exchange than from any other house.

Elmira, N. Y.

Messrs. Goldsmith Bros., Chicago.

Your plate gold has given entire satisfaction. It works as nicely as any I have ever had from any of the dental houses. It's all right. Robt. A. Wilbur.

Milledgeville, Ill.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—The working qualities of your gold plate and solder have given entire satisfaction. Have yet to find any that has cracked if properly annealed when swedging, as I have experienced in other makes.

W. A. Overholser, D. D. S.

Colon, Mich.

Messrs. Goldsmith Bros., Chicago.

Gentlemen:—I have been using your gold for some time for crown and bridge work. For fine working qualities and richness in color it is unsurpassed. Last, but not least, your price is right.

A. J. Kiser, D. D. S.

Bellevue, O.

Gentlemen:—I have used your gold plate for several years and take great pleasure in recommending it to the profession as the easiest working and the best quality of any gold I have ever seen or used.

Dr. F. A. Higgins.

GOLDSMITH BROS.,

Smelters, Refiners and Manufacturers of Dental Specialties,

Office, 63 Washington St. Works, 58th and Throop Sts.

NEW YORK OFFICE, 29 W. 42d St. CHICAGO, ILL.

Please mention the DENTAL DIGEST when writing to advertisers.

"The Proof of the Pudding Is in the Eating."

Read what others say who have used our plate.

TESTIMONIALS.

52 No. Pearl St., Albany, N. Y.
Goldsmith Bros., Chicago, Ill.
Dear Sirs:—It gives me great pleasure to be able to express to you my opinion in regard to your gold. I have worked gold for nearly 35 years, and can say it is the best working gold I ever used, and I can recommend it to every dentist; all I can say, try it and you will use no other.
Fred G. Michel, M. D. S.

1125 Madison Av. & 346 Sixth Av., N.Y.City.
Goldsmith Bros., Chicago, Ill.
Dear Sirs:—I hereby testify that I am highly pleased with your gold solder and cylinders which I have purchased from you. They are far superior in working quality to any I have ever used.
Dr. Bernerd H. Bromhery.

Warsaw, Ind.
Goldsmith Bros., Chicago, Ill.
Gentlemen:—I have never used gold in all my life that gave such perfect satisfaction as yours. The working qualities and luster are perfection, easy to manipulate, never cracking or breaking, as I have seen gold do, but perfect in every detail.
John R. White.

New York.
Messrs. Goldsmith Bros., Chicago, Ill.
Dear Sirs:—Have been using your Dental Specialties since their introduction in this city, and find them high grade in every respect—cannot speak too highly of your gold plate and solder. Lenox Dental Parlors,
A. Walter Herman, D. D. S., Prop.

Springfield, Ill.
Dear Sir:—As far as I can tell the treatment accorded me has been universally honest and courteous, with a promptness in filling orders that has been commendable. Grafton Munroe, D. D. S.

El Dorado Springs, Mo.
Goldsmith Bros., Chicago, Ill.
It gives me pleasure to certify that I have used your gold with the most gratifying results and I have had success in all my work. I cannot too highly recommend it to the dental profession.
G. W. Sells, D. D. S.

Lancaster, Ky.
Goldsmith Bros., Chicago, Ill.
Dear Sirs:—It gives me great pleasure to recommend your gold plate to the dental profession. Have been using it for the past three years and find it first-class in every respect. W. L. Beasley.

Kokomo, Ind.
Goldsmith Bros., Chicago, Ill.
Gentlemen:—Your gold plate and solder has been entirely satisfactory to me and I don't believe it can be surpassed in working qualities and general appearance.
Norman Simpson, D. D. S.

Southport, Pa.
Messrs. Goldsmith Bros., Chicago.
Dear Sirs:—I have been using your gold for a year in crowning and bridge work, and am very pleased to say it is perfectly satisfactory. F. C. Pierce.

Quincy, Ill.
Goldsmith Bros., Chicago, Ill.
Gentlemen:—I am well pleased with the working qualities of your gold plate, and am satisfied I have always received full value in return for the scrap and fillings sent to you. H. F. Naumann, D. D. S.

Listowel, Ont.
Gents:—I am in receipt of merchandise and well pleased with both solder and plate.
W. B. Bruce.

BROACHES AND BURS.

Our Broaches are more durable and will stand tougher usage than any other on the market. Write for samples.

Grand Rapids, Mich.
Goldsmith Bros., Chicago Ill.
Gentlemen:—Having used your gold and broaches, and, in fact, everything you manufacture, can't say too much in praise; your gold is the best I ever used. Have been a gold and bridge worker for over 15 years and know what I am talking about.
D. Murray, D. D. S.

Oneida, N. Y.
Goldsmith Bros., Chicago Ill.
Gentlemen:—Please send me as soon as possible 1 doz. of the "Try Me" broaches, assorted sizes. I am charmed with the gold you sent me, and if you keep it up to that standard "I shall think the 'gates of heaven' have opened up before me." It works beautifully, the finest I have ever had.
A. V. Needham.

GOLDSMITH BROS.,
Smelters, Refiners and Manufacturers of Dental Specialties,
Office, 63 Washington St. Works, 58th and Throop Sts.
NEW YORK OFFICE, 29 W. 42d St. CHICAGO, ILL.

GOLD SOLDER.

As good tools are the first requisite to good workmanship, so is a good solder absolutely essential to the turning out of good plate or bridge work. It is certainly annoying to have a job nearly finished, then spoil it by burning your gold or having the solder one color and the plate another. Why take chances? You run absolutely no risk by using ours. Our solder does not ball or oxidize, does not discolor in the mouth; being made of chemically pure metals we can guarantee it in every respect. We will mail on request a sample of our solder. Flow it beside the kind you are using and we will be willing to abide by your judgment.

TESTIMONIALS.

Rochester, N. Y.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—We have been using gold and solder in the manufacture of crown and bridge for the past 10 years and have found none that can equal yours. We use no other. Thanking you for promptness in filling orders. J. L. Weller.

Black River Falls, Wis.

Gentlemen:—Have used your gold plate and solder almost exclusively for 7 years, they have been highly satisfactory, always up to the standard and have a fine color. Wishing you prosperity, I am,

Joseph W. Boisol.

Aspen, Colo.

Dear Sirs:—Have used your gold plate and solder almost exclusively during the past three years. It has given me entire satisfaction in every respect, and intend to continue its use as heretofore.

W. R. Wilson, D. D. S.

Albany, N. Y.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—I am glad to add my testimony to the good quality of your gold and solders, also that you give me the highest price for scraps and fillings.

James W. Hine.

Kingston, N. Y.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—I take pleasure in assuring you that I have found your materials, likewise your dealing, most satisfactory.

A. L. Hill, D. D. S.

San Diego, Cal.

Gentlemen:—I have used your plate and solders exclusively for nearly six years, and have invariably found them all that could be desired. While in Chicago in '93 your various dealings with me were so square and straight up that you secured a permanent customer. G. W. Earl, D. D. S.

Chicago, Ill.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—I have used your gold plate and solders for the past ten years and find them the most uniformly satisfactory of any I have tried. Your gold and platinum solder is especially firm in porcelain work.

G. A. Thomas,
Mgr. Thomas Dental Laboratory,
92 State St.

Shreveport, La.

Gentlemen:—I do a great deal of crown and bridge work and purchase nine-tenths of my solder from your firm. I find it very superior and entirely satisfactory. In exchanging gold scraps for solder from you, I find I receive better value from you than from any source I have ever tried.

Charles McCloud, D. D. S.

Brooklyn, N. Y.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—I have been using your gold plate and solder for the past six months and find them to be equally as good, if not better, than any I have used heretofore.

C. R. Moulton.

Cedar Rapids, Ia.

Messrs. Goldsmith Bros., Chicago, Ill.

Gentlemen:—I have used your gold plate and solder for several years, and have always found them highly satisfactory in every respect. J. F. Kittoe.

Charleston, W. Va.

Dear Sir:—Your solder and gold, of which I have used a good deal, is of the best in color, the solder flows easily; can heartily recommend it. A. H. Boyd.

Dover, N. J.

Messrs. Goldsmith Bros., Chicago, Ill.

Dear Sir:—Your plate gold has proven more than satisfactory, and for color and easy flowing qualities your solder cannot be equaled. Dr. R. B. Bryant.

Wellsburg, W. Va.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—I desire to say the gold and solder purchased from you has been entirely satisfactory to me. W. K. Cummings.

Chicago, Ill.

Messrs. Goldsmith Bros., Chicago, Ill.

Gentlemen:—Your gold plate and solder have given such eminent satisfaction that we use them exclusively in the manufacture of our improved seamless tooth crowns and bridges. Berry & Co.

Sturgis, S. D.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—Your gold and solders have given entire satisfaction. I have used several makes of gold plate and solders and like yours better than any other.

H. P. Smith.

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Smelters, Refiners and Manufacturers of Dental Specialties,

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NEW YORK OFFICE, 29 W. 42d St. CHICAGO, ILL.

We believe in testimonials and hereby publish a few. We have pleased others and we know we can please you.

TESTIMONIALS.

Ashland, Ohio.

Messrs:—Enclosed find gold scrap and filings, all 22K. except solder in filings. Please send gold solder 10 and 18 K., equal quantity. The gold solder sent in last order was fine. H. J. Cressinger.

Lansingburg, N. Y.

Am pleased to say that I find your plate and solders of even carat and excellent working quality. F. M. Ponloon.

Darlington, Wis.

Gentlemen:—We have used your gold and solder for some time and are very much pleased with it. Have not used the Columbian alloy long enough to give it a test, but it certainly works very nicely.
Palmer & Leslie.

Jesup, Ga.

Messrs. Goldsmith Bros., Chicago, Ill.
Gentlemen:—Your gold and solder gives us general satisfaction in every way. We use no other. Jesup Gold Crown Co.,
By Ellis, Manager.

Newark, O.

Goldsmith Bros., Chicago, Ill.
Gentlemen:—I have been using your plate and solder for several years past and find them all that can be desired. The plate is of a good rich color and works nicely; the solder flows like water
Geo. H. Woods, D. D. S.

Kalamazoo, Mich.

Goldsmith Bros., Chicago, Ill.
Gentlemen:—We take pleasure in recommending your solder and gold plate. We have never used any we consider its superior. Miller & Cook.

Columbus, O.

Goldsmith Bros., 65 Washington st., Chicago.
Dear Sirs:—I have used your gold solder for some time; it gives entire satisfaction.
Clare Smith.

Chicago, Ill.

Goldsmith Bros., 63-65 Washington st., City.
Gentlemen:—I have used your gold and solder almost exclusively for the past eight years and have found them uniform in color and fineness and by all odds the most perfect "working" metals I have been able to obtain. Their cheapness is also a decided advantage. I commend your business method as well. Frank H. Davis.

Bourbon, Ind.

Dear Sir:—For flowing qualities and color your solder equals any I have ever used. Since trying your cylinder foil have used no other. It may have its equal for cohesiveness, but if so I have never found one. This is the only foil I have ever used for contour fillings that required no annealing. L. E. Webb.

Grand Rapids, Mich.

Goldsmith Bros., Chicago, Ill.
Dear Sirs:—After using your solder in comparison with other makes, I find it equally satisfactory in every particular. The gold refined by you has given me perfect satisfaction. I am pleased to express my appreciation of your honorable, careful and prompt attention to my orders.
E. R. Jackson.

Algona, Iowa.

Goldsmith Bros.
Dear Sirs:—The gold solder and check for $6.45 at hand. I am very well satisfied with price received, also with solder, which I find to flow very evenly and is of good color. I shall remember you in the future. E. S. Glasier.

Arcanum, Ohio.

Goldsmith Bros.
Gentlemen:—Enclosed find $4.50, for which send me 3 dwt. 18K. and 1 dwt. 20K. gold solder and one dozen of your new broaches. W. E. Wilkinson.
P. S.—I have now used your solder for about three years, and must say I can find no other that gives me the satisfaction it does.

Monroe, La.

Messrs. Goldsmith Bros.
Gents:—Enclosed find express money order for $15.00 (fifteen dollars), for which please send us the following: 2 dwt. 24K. G. gauge; 4 dwt. 18K. solder; balance of the amount in 20K. Gold Plate, 30 gauge. We are well pleased with your goods and your fair dealings. Massengill & Johnston.

Bowmanville, Ont.

Messrs. Goldsmith Bros., Chicago, Ill.
Dear Sirs:—Kindly send me by return mail, solder, the amount found below. Send this equally divided in two (2) envelopes. I enclose you express order for same. I bought your solder some time ago and found it very satisfactory.
Norman B. Hall, D. D. S.

Bay City, Mich.

Goldsmith Bros., Chicago, Ill.
I have used your gold plate and solder several years, and consider both second to none on the market. J. R. Hanley.

Temple, Texas.

Goldsmith Bros.
Gentlemen:—Yours received, and in reply will say, gold and solder flows like water down hill. Thanks for your promptness, etc. W. R. Tyler.

Chicago, Ill.

Messrs. Goldsmith Bros., Chicago, Ill.
Gentlemen:—Have used your solder about five years; it seems to be all that should be required of any solder.
Frank H. Skinner, D. D. S.

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"FILLING GOLD."

The large number of unsolicited testimonials we receive daily from those using our filling gold warrants us in making the assertion "that we have the best in the market." Why not send us a trial order and convince yourself? We will guarantee it to give absolute satisfaction. We claim that it is absolutely perfect. There are others who also think so, as you will perceive by reading these testimonials.

TESTIMONIALS.

Earlville, Ill.

Messrs. Goldsmith Bros., Chicago.

Dear Sirs:—Enclosed you will find P. O. money order, for which please send me ⅝ oz. ¾ size soft gold pellets to close balance of my account. It is the nicest working gold that I have had the pleasure of using.

Dr. Geo. Giles.

Columbus, O.

Messrs. Goldsmith Bros., Chicago.

Gentlemen:—We appreciate very much your kindness and promptness in sending us gold plate, etc., as ordered, which has always been satisfactory. J. B. Kirk & Son.

Worcester, Mass.

Messrs. Goldsmith Bros., Chicago.

Dear Sirs:—I have always found your gold satisfactory and just what you say it is. G.-F. Harwood, per E. L.

Fergus Falls, Minn.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—It gives me great pleasure to recommend to the dental profession your gold foil and cylinders. It is the most perfect gold I have ever used. What I mean by perfect is easy working; does not ball up under the plugger and makes a hard, dense filling. J. E. Metcalf.

Goldsmith Bros., 65 Washington St., Chicago.

Dear Sirs:—I have used your gold for crown and bridge work for the last few years and find it very satisfactory. I have also used your cohesive cylinders for the last year and find it to be the easiest gold to manipulate I have ever used, and I have tried most forms on the market.

J. B. Dicus, D. D. S.

New York City.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—We take great pleasure in recommending all the materials which you have furnished us with and gladly express our entire satisfaction.

Union Painless Dental Co.

Elwood, Ind.

Gentlemen:—Your gold foil works as good as any gold can work, your solder is as good as any of the high-price goods, and the saving in a year's practice is a very nice thing to buy bread for the babies.

D. C. Harold, D. D. S.

La Harpe, Ill.

Goldsmith Bros., Chicago, Ill.

Dear Sir:—The gold foil has given me the best of satisfaction, and take great pleasure in recommending both your foil and solder as the best on the market.

Ralph Nelson, D. D. S.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—I have used your alloy for two years and find it good. I shall want more when this is used. One can finish a filling at first setting better than with many other alloys. W. O. Speve.

Chicago, Ill.

Goldsmith Bros., Chicago, Ill.

For several years I have been using your gold, platinum and solders. Believing you have attained a superiority in such I will continue to use them. E. Goldthorp.

70 State St., Chicago, Ill.

Hastings, Mich.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—Your pure gold cylinders is the best gold I have ever used. You do not have to bother with an alcohol lamp at all.

W. A. Lampman.

Harvard, Ill.

Goldsmith Bros., Chicago, Ill.

In using your gold I find that it is equally as good as any that I have ever used, and far better than most others, and in a practice of nearly 30 years I have used all kinds. S. F. Brainard.

Shell Lake, Wis.

Gents:—So far as I have used your cylinder gold I am very well satisfied. It is the best I have ever got hold of and works to perfection. O. F. Baker, D. D. S.

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TESTIMONIALS.

Noblesville, Ind.

Goldsmith Bros., 63-65 Washington St., Chicago.

Gents:—Please find $1.45, little balance on gold foil. Please excuse delay. I have used nearly all makes of foils, but yours beats them all. It's a great satisfaction to use such foils. As long as it keeps its present qualities I want none better.

T. F. Farmer, D. D. S.

Baraboo, Wis.

Goldsmith Bros.

Dear Sirs:—I am very much pleased with the cylinder gold you sent me. I find it equal to the best. Dr. A. E. Capener.

Appleton, Wis.

Goldsmith Bros., Chicago.

Dear Sirs:—Am very much pleased with the working qualities of your gold cylinders; like them the best of any I have ever used; shall continue to use them.

W. L. Lamb, D. D. S.

Chippewa Falls, Wis.

Gentlemen:—I have used your gold cylinders and foil, also gold plate and solder, with great satisfaction, and I have never used any kind which I liked better.

W. H. Bailey.

Madison, Wis.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—Have been using your gold in the form of cylinders for some time and find that it has that soft working quality so essential to any gold used for the filling of teeth. Samuel A. Nielson.

Elroy, Wis.

Dear Sirs:—Your gold cylinders give me perfect satisfaction, and can recommend it to the profession. C. W. Nerud.

La Crosse, Wis.

Messrs. Goldsmith Bros.

Dear Sirs:—Up to this date your gold cylinders have given me the best satisfaction of any gold I have used.

C. W. Sanderson.

Temple, Tex.

Messrs. Goldsmith Bros.

Gentlemen:—Your cylinder gold is perfectly satisfactory; I recommend same to the dental profession. Your solder cannot be better. W. R. Tyler, D. D. S.

Flushing, Mich.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—I have used your cylinder gold with very satisfactory results.

A. E. Ball, D. D. S.

Parkersburg, Ia.

Goldsmith Bros., Chicago, Ill.

Have tried your gold foil. It is all right. Will order more soon.

M. W. Warner, D. D. S.

Eau Claire, Wis.

Goldsmith Bros., Chicago, Ill.

Your gold cylinders work fully as well as any cylinders I have ever used. I have used nothing else since I commenced using your gold. J. A. Reynolds, D. D. S.

Ypsilanti, Mich.

Dear Sirs:—I have used ½ oz. of your gold foil; it is perfectly satisfactory; it is very tough and cohesive. I shall use more in the future. John A. Watling.

Jewell, Kan.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—Your foil is equal to any and superior to many I have used. It works easy and possesses every quality to be desired in a first-class foil.

A. Kuns, D. D. S.

Crowley, La.

Goldsmith Bros.

Dear Sirs:—It gives me great pleasure to say that I am well pleased with your chemically pure gold foils after having used them some time. W. F. Beatty, D. D. S.

Niles, Mich.

Goldsmith Bros., Chicago, Ill.

In regard to your gold foil would say, I have used your semi-cohesive gold cylinders exclusively for the past year and find them equal to any on the market.

C. P. Hanson, D. D. S.

Primghar, Ia.

Goldsmith Bros., Chicago Ill.

Dear Sirs:—In your testimonials in the "Bur" I find my brother, E. W. Kuehn, speaks very highly of your cylinders. Since he advised me to use the same, I am more than pleased with them. Wish you to send me your price list of old gold.

F. J. Kuehn, D. D. S.

Dyersville, Ia.

Goldsmith Bros., 63-65 Washington st., Chicago.

I have been using your gold foil for some time and find it very good. It gives me entire satisfaction. W. D. McErlain.

Paw Paw, Ill.

Goldsmith Bros., Chicago Ill.

Gentlemen:—Enclosed find P. O. money order $8.50, for which please send No. 4 cohesive corrugated gold foil. I borrowed some of your foil from neighbor dentist (E. E. Ross, Shabona, Ill.) and find it works so nicely I expect to use it in future.

J. B. Dougherty.

Chanute, Kan.

Goldsmith Bros., Chicago Ill.

Dear Sirs:—Your sample of gold has proven very satisfactory. Please send me ½ oz. small cylinders. I enclose draft for $3.50. E. B. Park.

GOLDSMITH BROS.,

Smelters, Refiners and Manufacturers of Dental Specialties,

Office, 63 Washington St. Works, 58th and Throop Sts.

NEW YORK OFFICE, 29 W. 42d St. CHICAGO, ILL.

COLUMBIAN ALLOY.

There are many alloys on the market and naturally their makers all claim them to be good, or, perhaps, the best. We don't want to toot our little horn too much, BUT we do claim that ALL the good qualities of an alloy is concentrated in the Columbian Alloy. Only chemically pure metals are used in its manufacture.—We have had twenty years' experience in the making of alloys. The general satisfaction Columbian Alloy has given to all who have used it makes us positive that it will please YOU. We will let the testimonials below speak for themselves.

TESTIMONIALS.

Hot Springs, Ark.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—I have been using your Columbian alloy for the past four years and consider it the best in any particular that I have ever used. I can certainly recommend it as par excellence. I am using it exclusively in my practice with the most satisfactory results.

E. D. Allison, D. D. S.

Farmington, Ill.

Goldsmith Bros., Chicago, Ill.

Dear Sirs:—Send me by return mail 3 oz. of Columbian gold and platinum alloy. I have used 10 oz. or more of your alloy and find it makes a good filling and has good edge strength. A. H. Lash.

E. Corinth, Me.

Goldsmith Bros., Chicago, Ill.

We have used your Columbian alloy for some little time, and have found it shrinks less than any alloy which we have heretofore used. Lindley & Dickinson.

Hudson, N. Y.

Goldsmith Bros.

Gentlemen:—The alloy you refined for me was very satisfactory Frank W. Ketner.

Wilkesboro, N. C.

Goldsmith Bros., Chicago.

Gents:—I like the "Columbian" very much, and find it as easily worked and as free from discoloration as many of the higher priced alloys W. C. Greene.

Ottawa, Ill.

Goldsmith Bros., Chicago, Ill.

Sirs:—I can say this for your Columbian alloy: In an experience of over twelve years I have not found an alloy that excelled it. A. C. Smith.

Bedford, Ia.

Goldsmith Bros., Chicago, Ill.

Gentlemen:—Enclosed find a small quantity of gold scraps, which I wish to exchange for its value in Columbian alloy, which please send to my address at your earliest convenience. You will please permit me to say that since I have used about 5 ozs. of this alloy, I find it an ideal amalgam filling; its smooth working quality, together with its superior edge strength, makes it one of the most desirable filling materials I have ever used, and my practice of nearly 20 years has enabled me to test almost every amalgam that has from time to time found its way into the markets.

G. F. Manker.

SAVE YOUR SWEEPINGS,

Save anything, in fact, containing gold. It will pay you. We will pay you 1½ cts. each for rivets in teeth. Send them in. Send us your gold clips, fillings, old amalgam. We know you will be pleased with the prompt and accurate returns we make you. If you wish we will make you an offer and hold shipment subject to your order. If our offer should not prove satisfactory, we will return at our expense.

PRICE LIST:

Gold Foil, ½-oz.	$ 3 25
Gold Foil, per oz.	25 00
Gold Cylinders, ½-oz.	3 50
Gold Cylinders, per oz.	26 50
14K Solder, per dwt.	65
16K Solder, per dwt.	75
18K Solder, per dwt.	85
20K Solder, per dwt.	95
Coin Solder, per dwt.	1 00
22K Solder, per dwt.	1 00
18K Gold Plate, per dwt.	85
20K Gold Plate, per dwt.	95
22K Gold Plate, per dwt.	1 05
24K Gold Plate, per dwt.	1 10
Coin Plate, per dwt.	1 02
Clasp Metal, per dwt.	85
Clasp Wire, per dwt.	1 00
Platinized Gold, per dwt.	1 15
18K Gold Wire, per dwt.	90
20K Gold Wire, per dwt.	1 00
24K Gold Wire, per dwt.	1 15
Platinum Sheet or Wire, per dwt.	Market Price
Platinum Iridio Wire, per dwt.	Market Price
Pure Silver, per oz.	$ 0 57
Columbian Alloy, $2.00 per oz.; 3 oz. for	5 00
65 Silver, 35 Tin Formula, $1.00 per oz.; 10 oz. for	7 50
Aluminum, per oz.	10
German Silver Plate, per oz.	10
Pure Zinc, per oz.	10
Pure Tin, per oz.	07
Pure Copper, per oz.	05
Pure Bismuth, per oz.	20
Broaches, per doz.	1 00
Burs, per doz.	75
Carborundum Strips, per box	35
Corborundum Disks, per box	08

We cut to Pattern without extra charge.

We Pay the Following Cash Prices for Scrap Gold, Platinum, Etc.

Gold Fillings, per dwt. $1 00	Gold Filings, per dwt. 60c to 75c
Gold Scrap, per dwt. 72c to 88	Platinum Market Price
Platinum Pins 1½c	Bench and Floor Sweepings Refined.

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Please mention the DENTAL DIGEST when writing to advertisers.

TRUST FORCED TO IT

February 23 of this year we announced a substantial reduction in the price of rubber dam, and now the largest house in the Dental Trust has reduced its price, being still higher, however, than we are. It now sells one yard of dam for $1—**our price is 85c;** medium, $1.50—**our price is $1.25;** thick, $2.80—**our price is $1.70,** and furthermore, we give **a discount of 10 per cent for cash.** This Trust house does not state why it made the reduction, but it is barely possible that it was done because our sales on dam in the past four months have increased ten fold. Consequently, we want the credit for the lowering of prices on dam. Also, we want your trade. We offer

Medium Dam at $1.25 for a full square yard.
Thin Dam at 85c for a full square yard.
Thick Dam at $1.70 for a full square yard.
Half yards—Medium, 65c; Thin, 45c; Thick, 90c.

Kleinert "Handy Squares," 6x6, box.....$1.00
" Smooth or Corrugated, 6x9, box 1.50
" Medium Smooth, 6 inch, 1 yard roll..... 1.25

There are no "short" rolls in our stock.

Every yard we sell is 6 inches wide and 18 feet long, or 5 inches wide and 21 3-5 feet long, and contains a FULL SQUARE YARD.

EVERY ROLL WARRANTED.

Your money back if it is not just as good or better than what you have been using.

Dental Protective Supply Co.

1101-4 Champlain Bldg., Chicago.

Branch at 818 Real Estate Building, Philadelphia.

ANNOUNCEMENT.

We beg to announce to the many inquirers about the **WEDGELOCK TOOTH**, that we expect to have them on the market by January 1st, 1903.

To those not familiar with the **WEDGELOCK** tooth, we desire to say that it is a detachable tooth having a strong iridio-platinum pin to engage a slotted backing, which forms what the name implies — a **WEDGELOCK** attachment.

The **WEDGELOCK** tooth has all the good features of other detachable teeth and many that others do not possess.

The Following are a Few of the Characteristic WEDGELOCK Features:

The **WEDGELOCK** tooth can be ground at any point and the backing can be readily adapted to it, making it possible to obtain perfect joints.

There are no clumsy unfinished surfaces on the **WEDGELOCK**, especially at the cutting edge, where it is so desirable to have a smooth tapering finish.

Crowns can be easily made without investment if you use the **WEDGELOCK.**

The strength of dummy facings is greatly increased by means of the gingival extension, which removes fulcrum farther from pin.

The attachment of **WEDGELOCK** facings is so arranged that there is a cushioned seating of facing which very materially reduces the liability of breakage.

A uniform lingual contour is produced with a minimum amount of solder.

Simplicity and universal application mark the **WEDGELOCK.**

The **WEDGELOCK** facing may be easily and accurately replaced in case of repair.

SEND FOR ILLUSTRATED BOOKLET.

TRADE Wedgelock MARK

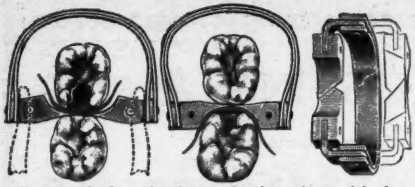
The Wedgelock Tooth Company,

F. E. ROACH, D. D. S., Pres.,

1305-6 Champlain Bldg.,

CHICAGO.

(Patented.)



Leonard Dental Matrix - Clamp

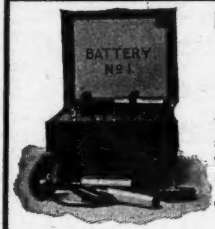
Composed of a pair of very elastic springs with clamping wedges swiveled and so shaped as to *Readily Adjust Themselves* to the irregularities of the teeth and the interproximate space.

Holds the matrix securely at the lingual buccal and cervical surfaces of the tooth, and loosely at *Three Points* of the cavity, the *Lingual* and *Buccal* margins, and at the place for *Contact Point*, thus insuring a flush filling and surplus for trimming and polishing. It also acts as a separator, thus facilitating contouring of the filling, which is so sadly neglected.

The spring bows, being reversible, are placed distally and are never in the way of the operator. No screws to putter with.

No. 1 Universal Bicuspid Matrix-Clamp, $1.25. No. 2 Universal Molar Matrix-Clamp, $1.25. Per Set, $2.35.

Order from your Dental Depot, or Lawrence P. Leonard, St. Cloud, Minn.



ELECTRICITY THE DENTIST'S FRIEND

Our DENTAL BATTERY

Is Indispensable to every Dentist.

With it you can immediately relieve Toothache, Neuralgia, Afterpain in Extracting, and all Pains of Head and Face.

Extracting and filling positively painless, in connection with any good local anesthetic. With it you can quiet the nerves of nervous people and children.

THE CURRENT—SMOOTH, GENTLE; NO SHOCK.

A treatise of all diseases and how to use them with each outfit. All parts nickeled and in polished wood cabinet.

The Price, $7 cash, or C. O. D. We pay all Express Charges.

THE ELECTRO MFG. CO., - Columbus, Ohio.

OBTUNDO

A new local anesthetic in which cocain is scientifically combined with chloretone, thereby producing a non-irritating and safe anesthetic. Acts immediately, not necessary to wait from one to five minutes, as with most other anesthetics.

To prove conclusively its superior qualities make comparative test by using Obtundo in one case and any other anesthestic you may now be using in another case (preferably in the same mouth if two or more teeth are to be extracted).

Directions: Inject thoroughly, using considerable force, and operate immediately.

Formula, Cocain. Chloretone, Nitro-Glycerin, Thymol, Menthol, Ol. Eucalyptus, Ol. Gaultheria, Ol. Caryophillia.

PRICE, $1.50 PER 2-OZ. BOTTLE.

Order direct or from your dealer. Prepared by

C. S. LEININGER, D. D. S., 967 N. ROBEY STREET, CHICAGO.

MORGAN, HASTINGS & CO'S

Latest Improvements in

GOLD FILLING MATERIALS

Extra Pliable Burnish Cylinders.

THESE cylinders are undoubtedly the most perfect Filling Material as yet placed before the Profession. Notwithstanding their comparatively high cost, they are extensively used. They work almost like Plastic Gold, and are absolutely reliable in all operations. Especially valuable in frail teeth, as they pack densely with minimum pressure, being at the same time very cohesive, soft and pliable.

1-16 oz. $2.25. ¼ oz. $17.00. 1 oz. $34.00.

Pure Gold Cylinders, Gold Ropes, Crystal Surface Rolled Gold, ⅛ oz. $4.00. ¼ oz. $15.00. 1 oz. $29.00.

Fine Gold Foil, ⅛ oz. $3.50. ¼ oz. $14.00. 1 oz. $27.00.

Gold and Tin Cylinders, ⅛ oz. $2.85. ¼ oz. $11.00. 1 oz. $22.00.

Morgan, Hastings & Co.

819 and 821 Filbert St., PHILADELPHIA

An error in the type occurred in the last ad of the

Lavoris Chemical Co.

If you did not notice it, no matter; if you did, note the correction:

LAVORIS *the new*
Astringent, Antiseptic
Detergent, Deodorant

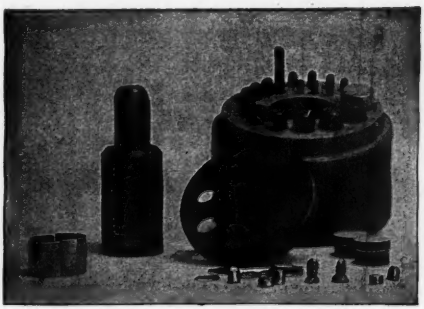
Contains in a pleasant and permanent form the astringent properties of Chloride Zinc, combined with Cassia Zeylanicum, and such antiseptics as Formaldehyde, Menthol, etc.

LAVORIS is recommended for the treatment of Pyorrhea Alveolaris, and is especially valuable for the treatment of surgical wounds of the mouth.

Free sample (express paid) to Dentists and Physicians.

Lavoris Chemical Co.

5 So. Sixth Street, MINNEAPOLIS, MINN.



The Place Seamless Crown System.

The only swage that will constrict the gold cap to any model perfectly, no matter how bell-shaped the tooth.

The root measure of a broken down tooth is obtained by fitting accurately a copper band so there is no guess work.

The model determines every outline of the crown so that accurate occlusion, contour and neck measure is assured.

System complete.....$15.00 or
Swage separate..... 5.00
Low fusible metal, 4 oz... 50c.

Place Crown Holder.

Just what you have been looking for. Holds any crown. Pressure on points under your control. Mailed on receipt of 50 cents. Apply to your dental dealer or address

J. W. PLACE, MFR.

TUCKAHOE, N. Y.

Please mention the Dental Digest when writing to advertisers.

DR. JENKINS'

PORCELAIN ENAMEL

Is now in daily use by over five thousand practitioners in different parts of the world. The revolution this material has produced in operative dentistry has not been equaled in the history of the profession.

Recent improvements and simplifications in the melting apparatus, as well as the economy of manufacturing on a large scale, have enabled us to place the complete Dr. Jenkins' Porcelain Enamel Outfit in the hands of dentists at the greatly reduced price of $60.00.

Dr. Jenkins' miniature furnace is the simplest and quickest for fusing Porcelain inlays. It is so reasonable in price ($10.00) as to be within the reach of all, and is less expensive to run than any other furnace. A two-year full guarantee given. Any furnace becoming defective during this length of time will be replaced free of charge.

By the use of a platinum-nickel melting cup any warping or bending of the cup is avoided.

On the Jenkins' Porcelain Enamel we have dwelt often enough in these pages. Suffice it to say, that we claim the greatest density; greatest resistance to crushing force; greatest variety and delicacy of shades; greatest gloss when fused; greatest resistance to acids of the mouth, and positively no change of color in the mouth.

Single Bottles.....$1.50 each

IF INTERESTED IN PORCELAIN WORK, LET US SEND YOU FREE SPECIMENS.

For Sale by the Dental Protective Supply Co. and all first-class Dealers in Dental Supplies.

Sole Agents and Manufacturers,

KLEWE & CO.

DRESDEN, Germany. **PORTLAND, Me.**

Ramesite Cement

is here advertised for the first time in cold type. All previous advertising has been through the medium of sample packages placed in the hands of careful, competent dentists, men who know the **purpose** of dental cements, and who were capable of judging their merits.

The fact that these men are now **buying Ramesite Cement** is proof that it is in no sense a "hasty conclusion."

On the contrary, **Ramesite Cement** is the result of long and painstaking experiments, subjected to every test before even a sample was given out for trial.

The steady growth of its sales in the territory covered by our business, together with the time it has been in practical use, warrant offering it generally to the dental profession with the assurance that **Ramesite** comes nearest being the ideal cement.

Price, $1.50 per package of two colors.

If your dental depot does not carry it, order direct from us. Write us for **Free Sample Package.**

Manufactured by

H. G. KNAPP,

219 Sixth Street, PITTSBURG, PA.

Please mention the DENTAL DIGEST when writing to advertisers.

CARBORUNDUM DIAMOND

After you have tried all other finishing strips, send postal card for samples of

SUPERIOR DENTAL FINISHING STRIPS.

Registered August 12, 1902. No. 9364.

They are made by a dentist for the dentist. 35c. per box containing one gross, or three boxes $1.00, and if not just what you want, return them, your money back by return mail.

Made in all grits, widths and the right length, assorted or all of one kind in one box.

This strip is our best product. Honestly made and an honest price.

Our extra coarse strip is a hustler.

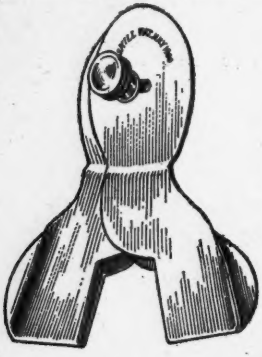
Order from your dental dealer or direct from us.

Remit by money order, cash or stamps.

SUPERIOR DENTAL STRIP CO.

F. MESSERSCHMITT, D. D. S. 138 MAIN ST., E., ROCHESTER, N. Y.

Samples Free for a Postal Card.



With DRISKILL'S ADJUSTABLE ARTICULATING BITE PLATE you secure a correct bite when you take the impression. A large number are now successfully using it in the United States and Canada. Eudore Dubeau, Secretary Board Examiners Dental Association, Montreal, Canada, says: "I have found it very useful." C. E. Frazier, Weatherford, Texas, says: "Your bite plate is the best on the market; you have succeeded in filling a long felt want." Made of highly polished nickel aluminum. With full directions, $1.00.

EURO-PHENIQUE.

This is composed of Phenic acid, Iodoform, camphor and eucalyptol. The Iodoform is odorless, and is held in suspension by the compound.

Wherever used it will render the development of bacteria impossible. In the treatment of abscess it has no superior. In abscesses with fistulous openings the remedy should be forced throughout the tract and in a large per cent of cases one treatment is quite sufficient. It can be carried into pus-pockets in the ordinary way, i. e., with an abscess syringe, or on a broach wrapped with cotton.

It is an ideal dressing for root canals prior to filling. Thoroughly dry the canal, wrap a few shreds of cotton on a broach, and carry the fluid to the apex of the root. Then press a gutta-percha point home, absorb the surplus fluid, and fill as you like. This remedy will penetrate the tubuli, and become an effective antiseptic. **50 cents per package.**

Address Dr. T. F. DRISKILL, Corsicana, Texas.

Please mention the Dental Digest when writing to advertisers.

"THE BEST STRIP MADE."

Dr. Howard's Dental Finishing Cloth Strips.

FIRST AND FOREMOST IN THEIR LINE
FOR FOURTEEN YEARS.

Made in four grits—Coarse, Medium Coarse, Medium, Fine, and in three widths—Broad, Medium, Narrow. Put up mixed or separate, as desired, in boxes containing an amount equal to one gross, of medium width, seven inches long. Send for them if your dealer does not keep them.

Manufactured only by

CHAS. T. HOWARD, ROCHESTER, N. Y.

DOCTOR!

IS YOUR ADDRESS IN

POLK'S DENTAL REGISTER

OF THE UNITED STATES AND CANADA?

IF NOT, SEND IT TO

R. L. POLK & CO., Publishers, DETROIT, MICH.

Every Dentist Uses Abrasives, but only he employs the **best** *who uses*

RUBY CRYSTAL

Ruby Crystal is made of even hardness. Will **retain its shape,** and will not glaze. Cuts all other abrasives as diamond cut glass.

Ruby Crystal is made in wheels, disks, points, files, hones, powder, and last, but not least,

DENTAL POLISHING STRIPS.

These strips are a revelation, and cannot be equalled. They are made in three widths: Broad, Medium, and Narrow, and four grits: Coarse, Medium, Fine and Extra Fine. **Price, 50 cents per gross.**

Our Guarantee We will refund full purchase price if **Ruby Crystal** proves unsatisfactory in any way, shape or form

All Dental Supply Houses carry **Ruby Crystal.**

SOLE MANUFACTURERS

F. W. Gesswein Company, 39 John Street, New York.

SOMETHING NEW

Dr. Bennett's
Curviform, Converse, ANGULAR BEAKED
FORCEPS

The Scientific Forceps of the day. Why?

Because:

1st—Being converse, angular, you cannot cut a tooth or root off with them. (They are for extracting, not cutting off).

2nd—You can take a deeper hold on roots of teeth with less pain to patient.

3rd—The grip on teeth is 50 per cent stronger than the old style forceps, therefore no danger of slipping off.

4th—Humane, Economical and Useful. Try them. Do your part and the forceps will prove to you their merits

Sent on approval to any reputable Dental House.

Price each
$3.00

Set of Ten
$25.00

For Circulars or further information send to

DR. G. L. Bennett
Patentee of the
O-K Beak Forceps
1002 Madison St.
CHICAGO, U.S.A.

For Sale by the Dental Protective Supply Co. and all Supply Houses

MANY MEN OF MANY KINDS,
MANY MEN OF MANY MINDS

find our Dental Rubbers "SUPERIOR"
—as claimed—as named.

● ● **A COMPLETE LINE—OUR OWN MAKE.** ● ●

Vulcanite — 21 shades.
Dental Dam — Light and Dark.
Tooth Polishing Cups, Discs and Points.
Plaster Bowls.
Bellows Discs.
Pure Rubber Separating Strips.
Gutta-Percha Temporary Stopping.
Rubber Tubing — Rubber Mats.

Well and favorably known to the Dental profession for many years.
High grade goods that cost no more than poorer products.

If your supply depot does not handle M. & W. goods we will be glad to serve you direct.

SAMPLES AND PRICES FURNISHED UPON REQUEST.
TRY THEM AND BE CONVINCED.

MORGAN & WRIGHT,
CHICAGO. NEW YORK.

ALL DENTISTS WHO HAVE USED THE
MUTUAL DENTAL SUPPLY COMPANY'S

Improved Temporary Stopping

Pronounce it the best stopping on the market.
Put up in three styles, pink, white and assorted. Price, per package, . . 35 cents.

LIQUID GOLD FLUX.—Use it and you will have no more balling of solder. Solder will flow wherever the flux is put. Price, per bottle, . 25 cents.

COLUMBIA SEPARATING FLUID.—Requires no soap, oil or varnish. Price, per bottle, . . . 25 cents.

MANUFACTURED BY THE

MUTUAL DENTAL SUPPLY CO.
79 SOUTH SACRAMENTO AVENUE, . CHICAGO, U. S. A.

FOR SALE BY ALL DENTAL DEPOTS.

THE GRISWOLD CLINICS

TYPICAL CASE No. 1.

No Teeth Posterior to Cuspid or Bicuspid.

The Griswold attachments will hold an upper denture firm where there are no teeth posterior to cuspids or bicuspids in both upper and lower cases.

This system allows the denture to be readjusted so that its anterior ends will always be supported by the gums even when absorption has taken place, thus avoiding all strain on the abutments and the loosening of the supporting teeth.

The Griswold attachments allow the plate to be readily removed for cleaning, yet when in place it is perfectly rigid.

The attachments may be reversed, the male member being soldered to the tooth cap and the female member to the denture, if the case requires.

The new Griswold outfits are furnished by all dental supply houses. Write for booklet or for information on special cases.

THE GRISWOLD DENTAL BRIDGE COMPANY

Sole Agents for Kister's Amalgam.

623 St. James Bldg. NEW YORK

The Philadelphia Optical College

C. H. Brown, M. D Prof't.

1022 Walnut Street, Philadelphia, Pa.

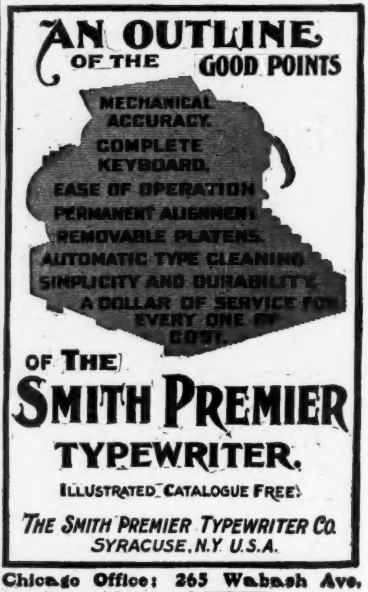
To Dentists in Small Cities:

Did you ever think of combining Optometry with your present practice? If you have given this matter any thought, there are many reasons that would present themselves in favor of such a step.

If you cannot attend here, our College will come to you in our Correspondence Department, through which, as an educated man, you can without doubt develop yourself into a skilled Optometrist, and at small cost.

If this strikes a responsive chord, write us and inclose 5 cents for

"The Key to Success in the Optical Profession."



Chicago Office: 265 Wabash Ave.

THIS IS... Dr. R. B. Tuller's Instrument

AND METHOD FOR THE PAINLESS EXTIRPATION OF LIVING SENSITIVE PULPS OF TEETH BY PRESSURE ANAESTHESIA THAT DOES NOT FAIL.

Open the cavity freely so as to allow the rubber tip to be placed exactly over the area of exposure.

A minute quantity of anaesthetic goes a long ways when made to go exactly where wanted. As shown by the cut the little rubber tip to the instrument is hollowed out.

Into this chamber a SMALL pellet of cotton is placed, saturated with the anaesthetic. Don't allow cotton to extend out over edges of the cup.

Place the cup over exposure and begin pressure gently, gradually increasing to considerable force. The cup edge will fit around exposure so closely that the fluid is confined while the steel point of the instrument compresses the cotton forcing fluid surely into the pulp. Anaesthesia should be complete in about three minutes. If tooth is large take longer time and recharge the cotton in the tip the second or third time.

If pulp is found sensitive when penetrated with a fine broach as a test, manipulation has in some way been faulty. Repeat with more care and see that rubber is pressed squarely down. Tilting to one side may allow medicine to escape.

Use a few crystals of cocaine or Parke, Davis & Co.'s cocaine pellets, prepared for hypodermic use, dissolved with two or three drops of water, or Dr. Green's Acestoria, which is ready for use, and if instrument is operated correctly confining liquid to area of exposure, failure will not occur. Infiltration occurs with the precision almost equal to the hypodermic needle.

Tips wear, become hard in time, and sometimes split. They are then useless. Examine before using to see that they are soft and perfect. An extra supply goes with each instrument; a new supply in packages of 50, fifty cents.

The instrument is double ended, the shank straight in one instance, and curved in the other to admit use in distal cavities. The handle is hard rubber, and all metal parts nicely nickel plated. A handsome instrument. The cut shows full size, also plan of tip.

This instrument will be found also very serviceable in pumping medicaments into and through putrescent root canals by filling the root with the liquid and placing the tip over opening, working with a rapid churning motion which relieves obstructing particles often wedged into the apical foramen and permits passage of medicine.

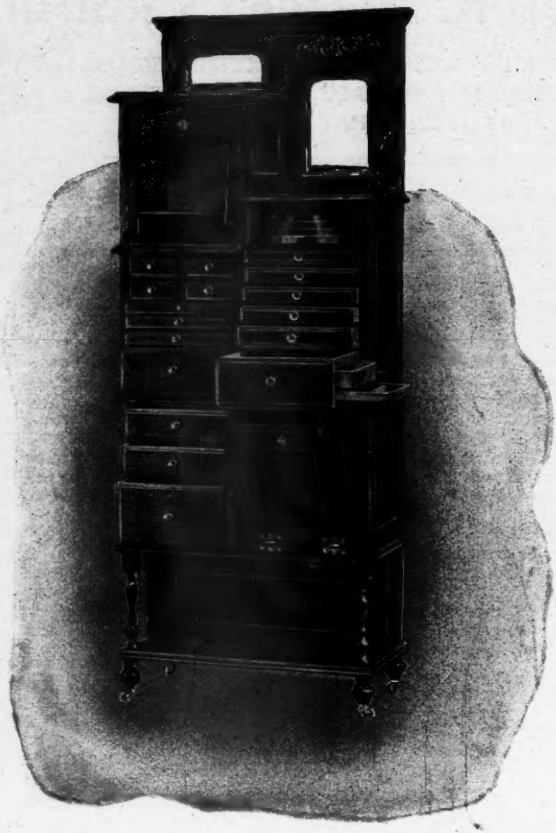
Think of time saved in a single operation, and satisfaction to patients.

Used by leading dentists of Chicago and elsewhere with success.

PRICE $2.00, PREPAID, BY MAIL.

(Send P. O. or Express Order; Checks cost exchange.)

R. B. TULLER Suite 1111, 100 State St., CHICAGO.



The above cut shows our No. 53 Cabinet. We manufacture a complete line of Dental Office Furniture, consisting of Cabinets, Laboratory Benches, Lathe Tables, Bracket Tables, Students' Cases, etc. Our goods are sold for cash or on easy payments. If your dealer cannot supply you, write to us direct.

SEND FOR PRICES AND DESCRIPTIVE CIRCULARS.

THE AMERICAN CABINET COMPANY

TWO RIVERS, WIS.

The Method of Injecting

has much to do with the success of Higgins' Local Anæsthetic. Do not inject the gum at the cervical margin. Inject just under the loose membrane nearly as high up as apex of root. Let anæsthetic raise a little white place just under membrane. Make firm pressure on side of white place, so as to drive anæsthetic into cervical portion of membrane. Make one injection opposite apex of root lingually, and one labially. Extract immediately.

THE EXTRACTION WILL BE PAINLESS

75c per oz. 3 oz. $2.00. 5 oz. $3.00. 10 oz. $5.00.

SOLD BY ALL DENTAL DEPOTS

If you have never used this anæsthetic and will send me 25 cents to pay postage, I will send a sample ounce that you may make a thorough trial. Non-secret. Formula with each bottle.

DR. F. A. HIGGINS, BELLEVUE, OHIO.

DEARBORN
NERVE PASTE.

WE GUARANTEE

IT WILL stop all pain in five minutes. devitalize within six hours. positively obliterate the most acute pain in partially suppurated pulps—and all forms of hypersensitive conditions.

Write us for testimonials,

... Price, **$1.00** per bottle,

Containing Sufficient for 750 Treatments.

SOLE MANUFACTURERS

Dearborn Dental Manufacturing Co.,

52 State Street, CHICAGO, ILL.

OBALGO

Is a Good Anesthetic.

Has No Bad After Results. No Sloughing of the Gums. It is Painless. Results are Guaranteed. It is the Cheapest Anesthetic on the Market. It is Harmless. Contains One Per Cent Cocain.

PRICE

60 cents per ounce.
$5.00 for 10 ounces.

MANUFACTURED SOLELY BY

Dearborn Dental Mfg. Co.,

52 State Street Chicago, Ill.

SINACINE DENTAL PLASTERS

An Accelerative Counter Irritant.

Unqualifiedly superior to any plaster that has ever been made for application within the mouth and so much more efficient in action than Capsicum that they have almost entirely superseded the latter and have become a necessity in dental materia medica. Entirely harmless for continued application and their penetrative power is very remarkable. Applied to the gum over the point of inflammation they will give almost immediate relief and in cases of deep-seated congestion will give results not to be obtained by the application of medicaments.

Put up 100 in a box in small envelopes of four plasters each, with directions for use.
100 plasters (25 envelopes).....50 cents.

SAMPLES SENT ON APPLICATION.

JOHNSON & JOHNSON, NEW BRUNSWICK, N. J., U. S. A.

The MORGAN-MAXFIELD Disk Mandrel

Patented May 21, 1893.

IS THE **BEST** ON THE MARKET.

FOR SALE BY ALL DEALERS.

The Many Imitations and Infringements are Poor Substitutes.

Folded.

The McConnell Chair.

DOCTOR, why enslave yourself with an immoveable, out-of-date Dental Chair, when you can buy one of those perfection McConnell Chairs for the little, insignificant sum of $16.50? It can be adjusted to any angle, from a perfectly up right position to a reclining one. Lowest position, 17 inches; highest position, 38 inches. Head rest has forward, back and side movement. It is an ideal Chair, and no well-regulated office is complete without one or more. It is just the thing for extracting and taking impressions. Guaranteed as represented or money refunded. Write for catalogue.

J. W. McConnell, D. D. S.
Patentee and General Agent. CORNELIA, GA.

NO COCAINE ANXIETY

TO the conservative practitioners, who do not use Local Anesthetics because of the many fatalities from the use of COCAINE and similar products—and to those who have been using COCAINE we introduce HELIOS—as it does away with the constant dread of a fatality which would ruin their professional standing. HELIOS is prepared from a new COAL-TAR product possessing the same Anesthetic qualities as COCAINE without any of the toxic effects of that dreaded drug. It can be used in any quantity without the least apprehension on the part of the practitioner.

HELIOS

NON-TOXIC

THE NEW LOCAL ANESTHETIC

A clear liquid of a pale pink color, being prepared from a newly discovered COAL-TAR product:

NO
COCAINE
EUCAINE
CHLORETONE
MORPHINE
ATROPINE

DIRECTIONS: Inject freely around the tooth and extract immediately.
Caution: Have your needle and syringe aseptic.
PACKED ONLY IN TWO-OUNCE VIALS.
Price, per 2-oz. vial.....$1.50
Five 2-oz. vials 5.00

SOLE WHOLESALE AGENTS
THE MEIER DENTAL MFG. CO.
St. Louis, U. S. A. Hamburg, Germany

FOR SALE BY ALL DENTAL DEALERS

Trade

TERRAPLASTICA

Mark.

DR. J. C. GRAFT'S IMPROVED COMPOUND.

A PERFECT IMPRESSION

Long sought for by the dental profession. Something entirely new. Just what the gold workers are looking for. No more checked teeth. Absolute safety in soldering investments. A complete investment soldered as readily as a single tooth. A metal cast direct from the impression. Finer, neater and better rubber work. Positively non-shrinkable. An absolute non-conductor.

Price per can, 25 cents. 5-lb. can, $1.00.

Dr. J. C. Graft's Superior Base Plate.

The strongest and thinnest Base Plate on the market. Plastic as wax. Rigid as metal.

The Base Plate is the color of the natural gums, and is especially adapted for making temporary sets WITHOUT VULCANIZING.

Will not crack or break under any ordinary conditions, even if dropped upon the floor.

It fits perfectly and will not "curl" nor soften under the heat of the mouth.

For trial plates for taking the bite it is unexcelled. It is used to mount teeth for temporary sets for six months to a year. It does not change its form in the heat of the mouth, but retains its position like a metal plate, neither softening nor losing its shape. If broken it is easily repaired, and when repaired is as strong as ever. Packed in boxes containing twelve sheets.

Price per box, 50 cents.

If you are looking for something good use

Dr. J. C. Graft's Perfect Impression Varnish

For Varnishing Plaster Impressions.

No soap, oil or coloring matter needed with this preparation in your laboratory. No sediment or waste; leaves the model polished and hard.

Price per bottle, 25 cents.

For sale at all Dental Depots.

Manufactured only by

TERRAPLASTICA MANUFACTURING CO.

Manufacturers of Dr. J. C. Graft's Dental Specialties.

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CLARK FOUNTAIN SPITTOON

We do not know of it. There is a cause for it.

TWO STYLES:

Double Bowl $65.00
Single Bowl 45.00

Write for our Catalogue.

A. C. CLARK & CO.

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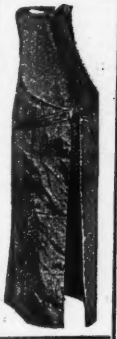
MOORE'S
Universal Spring Apron
IS THE BEST.

Why? Because it keeps the clothes clean and can be removed instantly. Try it and see. Made in cheviot, fast colors, and shrunken white cotton and black duck..... 75c



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Our METAL POLISH, for Gold, Silver and Other Metals, for use in crown and bridgework, and for finishing fillings, is the finest article of its kind. Per tube..... 10c

We have the best American-made **DENTAL MOUTH MIRROR** on the market. Plain or magnifying lens..... 75c

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FOR THE LATHE AND ENGINE.

Best yet produced for ANY kind of material and ALL styles of work.

EFFECTIVE——DURABLE——ECONOMICAL.

A TRIAL WILL CONVINCE YOU.

PRICES:

Lathe Wheels and Cones, single..... 15c
Sets of five..... 50c
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TRADE SUPPLIED. ASK YOUR DEALER TO SUPPLY **YOU.**

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Inventor and Sole Manufacturer, CHICAGO, ILL., U. S. A.

The Turner Improved Porcelain Furnace

No. 140 WITH BLOW PIPE AND GAUGE.

In this small furnace you will find the neatest, most compact and cheapest as well as the best furnace on the market. When porcelain is baked in this furnace it makes the most compact body and brings out the best color of any furnace known. You can make a bake in from 2 to 5 minutes at your pleasure.

THE TURNER FURNACE IS GREATLY IMPROVED BY THE ADDITION OF THE PRESSURE GAUGE.

No. 140. Furnace Outfit Complete as Illustrated,	**$25.00**
No. 1. Furnace only,	**15.00**
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Price, Complete with Case, $10.00.

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This system is endorsed by practitioners of high standing in the profession and is meeting with unqualified approval. A 48-page booklet with valuable suggestions on Porcelain work sent upon request.

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TURNER BRASS WORKS

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Gilbert's Temporary Stopping.

ABOUT twenty-one years ago this preparation was first offered to the Dental Profession — it was the first preparation for the purpose offered for sale. Its merits at once commended it, and the sales from the first were far above what could be reasonably expected, taking into consideration the fact that absolutely no effort was made to introduce the goods beyond placing them on sale in one or two dental depots.

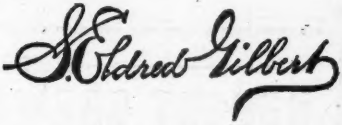
DR. GILBERT, the originator of Temporary Stopping as a commercial commodity, was at that time chief instructor in the Philadelphia Dental College. These duties, in addition to his regular practice, naturally consumed all his time, leaving none for commercial pursuits. After serving the College for eight years the Doctor resigned to devote his entire time to his growing practice.

This state of affairs continued until three years since, when, despite the fact that the sale of this preparation had not been pushed, it became necessary to organize the business on business principles, and the business manager was installed.

For several years it was practically the only Temporary Stopping on the market, then imitations began to make their appearance under various names and guises. The Stopping was copied to the best of other dealers' ability; every-one of them copied Gilbert's style of box, almost all reproduced his label, and some had the temerity to use the name (Gilbert's). Being unsuccessful in supplanting the genuine by these methods, the retail price was reduced, except in a few cases; extensive advertising was employed; and yet, in the face of all this competition, the sales of Gilbert's Temporary Stopping have steadily increased, until to-day the business is far in advance of anything we ever hoped for, and 90 per cent of all the Temporary Stopping used throughout the world is Gilbert's.

There is but one conclusion to draw from these facts—namely, that the imitations do not equal the "Genuine." It is evident that the profession want the "Genuine" only, and to protect them from inferior imitations, Gilbert has adopted a label distinctly his own, with the signature shown below printed in red across its face. Any goods without this signature are not ours but "IMITATIONS."

For sale by all leading dealers in dental goods.



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BREWSTER'S HIGH=

THE PORCELAIN USED BY THE LEADING PORCE-

An Invitation

Those members of the profession who are using Porcelain, or contemplating its use, and those who have purchased my Porcelain through Dental Houses and not direct from me, are invited to send me their names, so that I may send them a free sample of my XX Enamel Body, and a copy of Dr. W. T. Reeves' recent paper on Porcelain Inlays, read before the Michigan State Dental Society, in which the use of this XX Body is mentioned.

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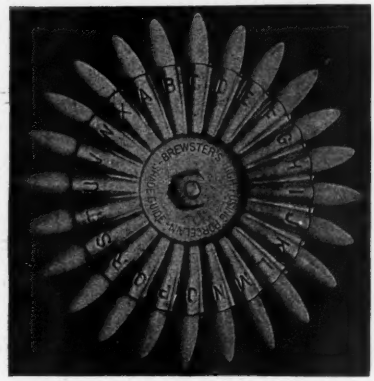
WHEN buying a Porcelain outfit it is well to buy one that has received the endorsement of porcelain experts throughout the country. IT WILL SAVE YOU BOTH MONEY AND DISAPPOINTMENT.

The "Enamel Body" (of which these points are composed) has been repeatedly tested on the dynamometer and found to register the same resistance to fracture as the best porcelain teeth.



BREWSTER'S NEW SHADE GUIDE forming part of his outfit of 27 bottles.

Price Complete $12.50

FOR dealing with a large variety of shades this is the most convenient form of Guide yet devised. It is light, compact, composed of nothing but aluminum and porcelain, may be thrown into the sterilizer and boiled. The shades are all in view at once, and by rotating opposite the teeth in the mouth, the correct shade is readily found. The points may be passed between the teeth.

HIGH-FUSING OIL COLORS, for use in Inlay Work, for changing the Color of Facings, Rubber Sets, etc.

Complete outfit, large size, $8.00
Complete outfit, small size, $5.50

FOR SALE BY DENTAL HOUSES AND BY THE MANUFACTURERS

THE BREWSTER DENTAL COMPANY, 2544 Princeton Ave. CHICAGO.

BREWSTER'S ALL-

A reliable and inexpensive Crown suitable for permanently crowning roots either with or without bands.

MANUFACTURED of the finest quality porcelain, and designed with anatomical correctness : : : : : :

POSSESSED of unusual strength owing to the quality of the porcelain and character of the metal post employed

THE special metal used for the posts, after soldering with 20-karat solder, is more rigid than platina : : : : :

WHERE no band is employed, the basal surface of crown, being correct in shape, permits of perfect adaptation to the root : : : : : : : : : : :

A PROPERLY prepared root, and a Brewster Crown properly adapted, with its small rigid post fitting the canal along its whole length, and the result is an ideal crown, with no danger of the root splitting : : : : : : : : :

MANUFACTURED SOLELY BY

THE BREWSTER DENTAL CO.

PORCELAIN CROWN

THIS cut shows a convenient method of holding a

BREWSTER CROWN

whilst grinding. The curved wheel has been found a great acquisition for grinding very small teeth.

A report of the clinic given by Professor Cigrand at the Northwestern College meeting, together with the methods employed by several prominent teachers and others, of preparing roots for the reception of the BREWSTER CROWN, is in the press and will be sent on request.

Put up in Sets of Six Sets of Four Pairs and Single Teeth.

Price of Crown complete with Post baked in, 40 cents.

Price of Vise, nickel-plated, 35 cents.

Price of Brewster's Curved Wheels, mounted, 30 cents.

MANUFACTURERS of HIGHEST GRADE PORCELAIN TEETH.
High Fusing Porcelain Body and High Fusing Oil Colors.
2544 PRINCETON AVE., CHICAGO, ILL., U. S. A.
FOR SALE BY DENTAL DEALERS EVERYWHERE

Vegetol

CEREAL DENTIFRICE

FOR

Sterilizing the Mouth and Hands, Bad Breath, Sour Stomach.

SOLD BY DRUGGISTS.

The mucus, of which the saliva is largely composed, does not dissolve in water, ether, alcohol or dilute mineral acids, but dissolves readily in alkaline solutions. "Vegetol" dissolves in the saliva, forming an antiseptic alkaline fluid. It also cleanses as a dentifrice without injury; is prophylactic, agreeable and refreshing.

THE VEGETOL COMPANY,

Send for sample, also booklet on the subject, containing formula.

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Is guaranteed to please or money refunded.

FREE Write us stating what anesthetic you are now using and we will send sample bottle free of charge.

U. S. Army Surgeon Lynde, of Buffalo, N. Y., says:

I have used Dr. R. B. Waite's Local Anesthetic extensively in general surgery for several years with perfect results, even in some of the most painful operations. It will be found by anyone using it absolutely efficient and safe in all the operations for which Local Anesthetics are ever used. No unpleasant effects, local or general, need be feared.

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FREE An all metal or glass barrel syringe upon receipt of your first $5.00 order.

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PRICE: 1 oz. $1.00. 2 ozs. $2.00. 6 ozs. $5.00. 12 ozs. $10.00. 20 ozs. $15.00.

OR MAILED UPON RECEIPT OF PRICE

THE ANTIDOLAR MFG. CO. Springville, Erie Co., N.Y.

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Dr. Peck's Porcelain Inlay System.

A Practical Course Under Personal Supervision,

ALSO

A MAIL COURSE.

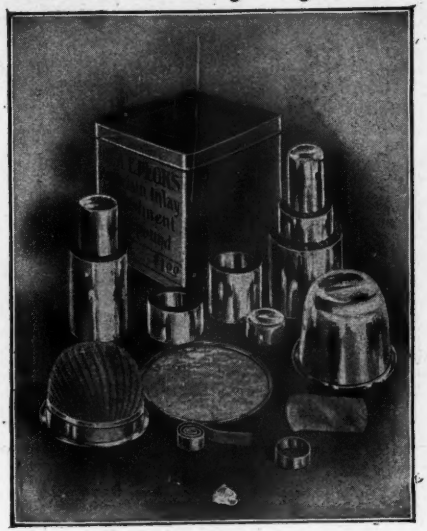
PERFECT SATISFACTION GUARANTEED BY EITHER METHOD.

Those taking the mail course receive models showing each step in the preparation of cavities, which are duplicated by them in natural teeth, and sent by mail for examination and criticism. When correct each succeeding step is taken up in the same manner until the full system is encompassed. This course requires from two to three weeks, occupying the dentist's leisure hours only.

For those who prefer personal demonstration, a laboratory has been equipped in Minneapolis for this work. The course is six days.

A set of the apparatus (as shown in accompanying cut), together with the treatise fully illustrated, is included in the price of the course, $40, in either case

Price of Apparatus with Treatise . . $15



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403 Medical Block,
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EFFICIENCY

Is the Essential Feature of Appliances Used by Discriminating Dentists.

You will find this in our Carborundum Rubber Disks.

WHY?

Because they
Cut very rapidly,
Are absolutely waterproof,
Are quite thin,
Flexible, very
Tough, and
Have great durability.

Used for Finishing Fillings, Shaping Teeth and Roots for Crowns and Bridges, Enlarging Spaces Between Teeth, and Grinding Porcelain Crowns, Inlays, etc. Three Grits. Sizes: ⅝, ¾, ⅞ inch.

PRICE

40 cents per package of 12 disks.

Our Abrasive Wheels for finishing rubber plates have great efficiency.

Its numerous layers of emery paper supplies a fresh surface whenever needed. Convex Edge fits all parts of plate.

Cuts with great facility,
And is accurately guided.
Is very solidly made, but
Its touch is elastic and
Retains its shape perfectly.

Will finish a plate in half the time required by any other appliance and do it better. Sizes: 1, 1⅜, 1¾ inches.

PRICE

15c, 20c, 25c each.

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"ONLY THE BEST"

CYLINDER GOLD,	per ounce,	$26.50
" "	per 1-2 ounce,	13.25
" "	per 1-8 "	3.50
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A PROPOSITION BEYOND BEATING

Suppose we offer and guarantee to you the finest quality of foil and cylinder gold in existence; supposing it is chemically pure and more cohesive and easier working than any other gold you have ever before used; suppose we put it into your hands at a price 10 per cent to 15 per cent lower than other golds—could you afford to ignore such a money-saving, work-bettering sensible proposition?

Our gold plates and gold solders are well known to the trade. Expert crown and bridge workers prefer them to those of any other make on the market to-day. There is no mystery about this. We are large refiners and manufacturers. This is why we can save you good dollars and cents on each pennyweight of gold you use, and supply you with better gold into the bargain. Drop us a line to-day.

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GOLD AND SILVER REFINERS

67 AND 69 WASHINGTON ST,. CHICAGO, ILL.

It is easy to turn out good crown and bridge work when you use the gold plate and gold solders made by Dee and Co.

...PRICE LIST...

14K Solder,	per dwt.	$ .65	
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18K "	"	.85	
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20K "	"	"	.95
22K "	"	"	1.05
Coin "	"	"	1.02
23K "	"	"	1.08
24K "	"	"	1.10
Crown Metal,	"	1.10	

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Platinum Sheet or Wire		Market Price
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Perfection Alloy,		$2.00 per oz., 3 ozs. for 5.00

All metals cut to pattern without extra charge.

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We pay the following cash prices for

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	Per Dwt.		Per Dwt.
Gold Fillings,	$1.00	Gold Fillings,	$ .60 to $ .75
Gold Scrap,	$ .72 to .88	Scrap Platinum,	Market Price

Bench and Floor Sweepings Refined.

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Gold and Silver Refiners and Assayers,

67 and 69 Washington St. :: ...CHICAGO

Perfection Impression Material.

It is impossible to make good work on a poor impression. Very little improvement has been made in impression materials for years. **Perfection Impression Material** is an entirely new production in this line, with which most excellent results can be obtained.

It softens in hot water in which the hand can be held without burning. Is made perfectly soft without being so hot as to burn the patient's mouth.

Then again it hardens very quickly in the mouth, and becomes so hard that it will not spring in a few minutes without applying cold water. The range of temperature required to change it from the soft to the hardened state is very small. As it can be used very soft, a very sharp impression can be taken with it. It is made in forms just right shape to fit your tray.

Price, per Box, 50c.

Perfection Base Plate.

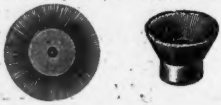
This is a hard base plate which will not soften or change shape in the mouth. It is much more easily fitted to the model than any other hard base on the market. It is almost as easily adapted as base plate wax. It is cut in blocks, right shape to fit the model, both upper and lower.

Price, Per Box, 35 Cts.

Unless otherwise ordered, each box will contain nine upper and three lower plates.

BRUSH WHEELS.

PATENT APPLIED FOR.



This is something entirely new in the way of a Brush for cleaning the teeth. They are the smallest Hub Brushes made. Cuts are full size. The hubs are metal, and the brush is so constructed that the bristles are held in place by wedging. As no glue or cement is used to hold the bristles in place, these brushes can be sterilized by boiling in water.

These Brush Wheels are put up on cards, one dozen on a card, and are not sold in smaller quantity. Unless otherwise ordered, they are put up assorted, four flat wheels and eight cups on each card. They can be furnished all flat or all cups if desired.

Price, per Dozen, 75 cents.

Detroit Dental Manufacturing Co., 93 Shelby St., Detroit, Mich.

Jodo=Formagen Cement.

Trade Mark registered in U. S. Patent Office, April 12, 1898, No. 31458.

POWDER
Jodo-Formagen-Cement
Trade-Mark registered in U. S. Patent Office
April 12, 1898 No. 31458.
the most recent and best preparation for the painless treatment of decayed pulps and their preservation.
Manufacturer of and dealer in all dental goods.
$1.50
Sole importer for the United States:
Gustav Scharmann
1181 Broadway
New-York City.
LIQUID

In acute and chronic pulpitis this preparation is astoundingly efficacious. It is in its essential parts a combination of Jodine salts and Formaldehyde on the one part, and Eugenol, Carbolic, Lysol on the other, in form of a quickly hardening cement.

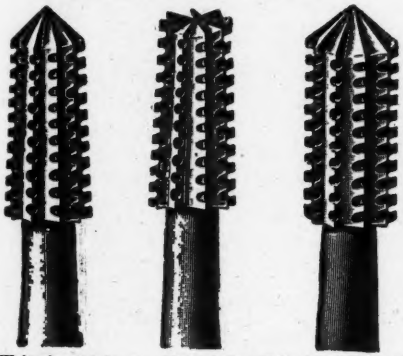
NO MORE ARSENIC. NO MORE EXTRACTION.

PRICES: Regular Package, . . . $1.50
Double Package, ... 2.50

Write for Pamphlet. Directions in each Package.

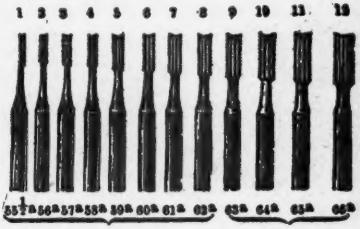
Cross-Cut Burs. Enamel-Fissure Burs.

$2.00 PER DOZEN.



All instruments stamped with this TRADE ← DAZF MARK.

Square Cylindrical.



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Sole U. S. Agent for B. Simonis, Berlin; A. Meisinger, Dusseldorf.

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W. J. TRUMPOUR, Manager. DR. J. C. McLEAN, Superintendent.

Experience is Economy

In the Dental Laboratory Business.

It is just this way:

A cheap laboratory man takes one-third longer to do a piece of work poorly, than a good man takes to do it right.

We employ only good men.

It is cheaper for us.

It is ten times cheaper and more satisfactory for you.

Our experience has been purchased dearly, but no matter. We are coining that experience into assets, and there are no greater assets than satisfied customers.

It is a fact that everyone makes mistakes. We make our share, but stand ready at all times to rectify them. No reputable concern will promise more.

Our customers are beginning to realize that when they order Consolidated, White's, Justi's, Dental Protective or any make of teeth, they get just what is called for. These concerns will bear us out in the simple statement that we buy their teeth.

Another thing; the money-making end of our business is the buying end. We do a large business and buy for cash. Buying for cash in quantity means bottom prices. Our price list shows that we share this reduction with our customers. Write for it.

Atlas Dental Laboratory Co.

(INCORPORATED)

35-37 RANDOLPH STREET, CHICAGO.

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Dental Gold Crown System.

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Those of the dental profession desiring to purchase a seamless dental gold crown outfit up to date in every detail will do well to wait. The price promises to be within the reach of all, and the outfit will be sold on easy cash payments. For further information, see the Dental Digest, January to May, 1902. Also write to

J. F. TWIST, Dentist,

Academy of Sciences Building, 819 Market Street,

SAN FRANCISCO.

Catalogue and testimonial list now being printed.

For Sale by Dental Protective Supply Co.

We Just Want to Show You

The Syringe you get when you order ten ounces of

SUP-RE-NOL

At $5.00.

The cut is an exact reproduction of our

"IDEAL" SYRINGE,

and we can assure you that there is nothing equal to it on the market.

Sup-re-nol is not a secret preparation—just a convenient local anesthetic for the busy dentist, made by experience from the best ingredients to be had and the most desirable for the purpose. It does not cause sloughing, is certain always in its action, safe in all cases, and will not deteriorate in any climate. The only anesthetic on the market that is sold at the proper price to the consumer. Your dealer can get you the syringe with your ten-ounce order, or you can send direct to us.

PRICE.

1 oz., 75c; 5 ozs., $3.00; 10 ozs., $5.00.

MANUFACTURED BY

IDEAL CHEMICAL CO., = St. Paul, Minn.

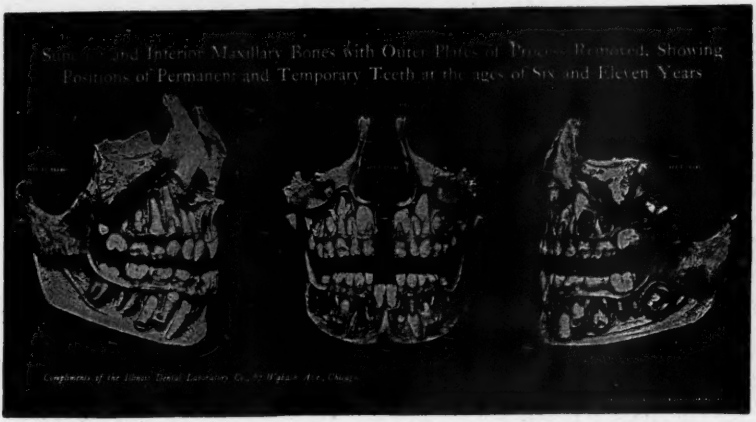
For Sale by The Dental Protective Supply Co., Chicago and Philadelphia.

DR. EDWARD F. KEEFE, MANAGER. DR. CHAS. H. WAMBOLD, SUPT.
DR. W. A. EVANS, SEC'Y. DR. CHAS. F. BRYANT, ASS'T SUPT.

Illinois Dental Laboratory Company

A Laboratory Conducted by Dentists

If you wish one of these charts, size 7 x 14 inches, send 10c. in stamps to the Illinois Dental Laboratory Co.


Superior and Inferior Maxillary Bones with Outer Plate of Process Removed, Showing
Positions of Permanent and Temporary Teeth at the ages of Six and Eleven Years

For $2.50 { We will furnish all materials, using Dental Protective plain or gum teeth, and make complete from impression, full upper or lower plate.

For $2.75 { We will furnish all materials, using Consolidated or Johnson & Lund plain or gum teeth, and make complete from impression, full upper or lower plate.

For $3.00 { We will furnish all materials, using S. S. White or Justi plain or gum teeth and make complete from impression, full upper or lower plate.

We make Celluloid and Metal Plates of every description.
We also make from Impressions, Gold and Porcelain CROWNS and BRIDGES.
Special attention given to Continuous Gum Work.
Send for Price-list and Mailing Boxes.

Illinois Dental Laboratory Company

67 Wabash Avenue, CHICAGO.

'PHONE CENTRAL 3480.

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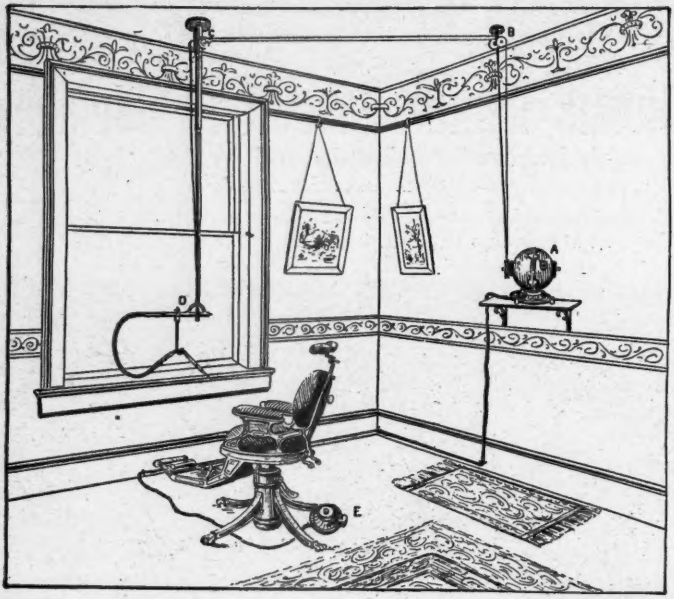

Rheostat. Cut 1-6 size.

THE LATEST

Motor (with groove pulley.)

L. J. MASON & CO.'S

New Electric Dental Engine for the 110-Volt Direct Current

PRICE COMPLETE, $70.00

Same outfit with motor large enough to run your lathe and engine for ten dollars more. You can put motor in laboratory.

This outfit consists of motor, rheostat (with ten feet of electric wire cable), ceiling bracket (either oxidized or nickel plated) swinging on a friction joint that holds engine head in any position around the chair, one pair ceiling pulleys, engine head, cable, sleeve, flexible attachment and coil spring, handpiece and fifty feet of engine cord.

The rheostat will give four speeds with instantaneous reverse or stop.

Everything first-class and beyond question the greatest value for the price quoted that has ever been offered to the profession.

Manufactured solely by . . . L. J. MASON & CO., 108 and 110 Randolph Street CHICAGO.

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Local Anesthetic for Extraction of Teeth and Minor Surgical Operations

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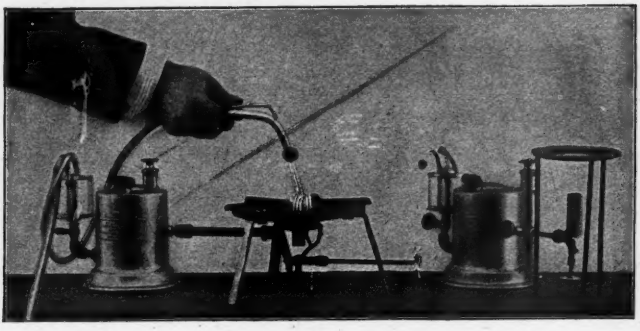

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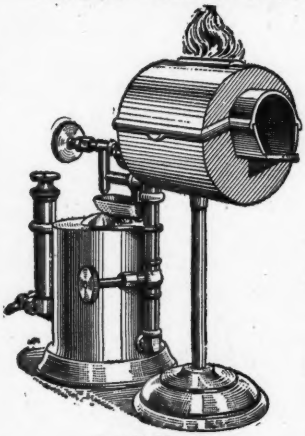

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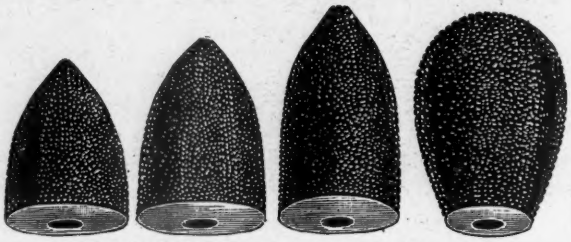

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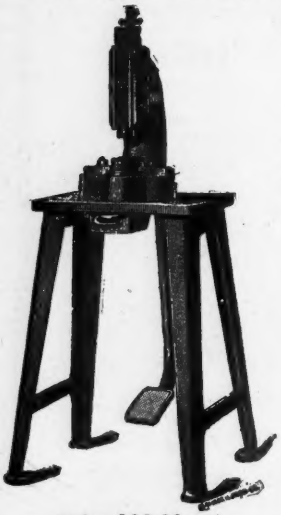

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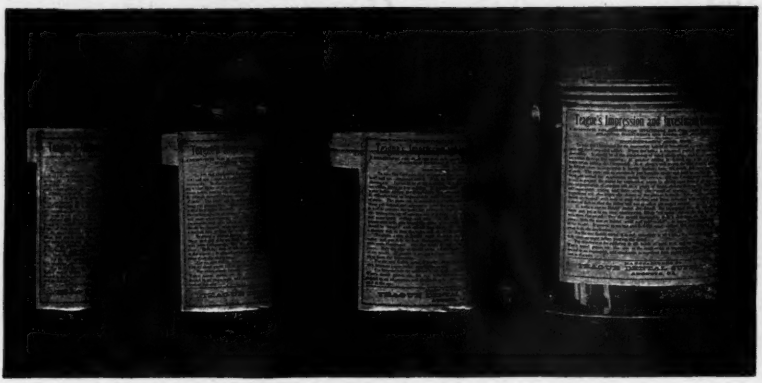

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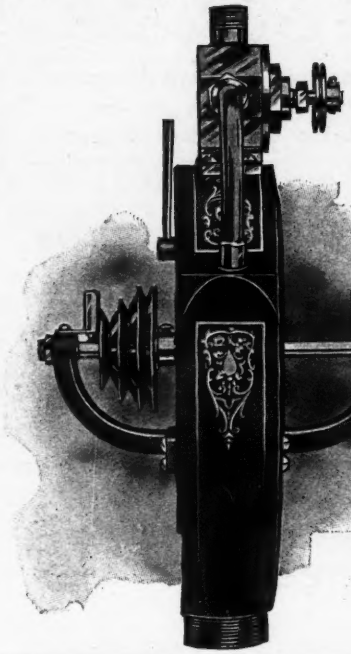

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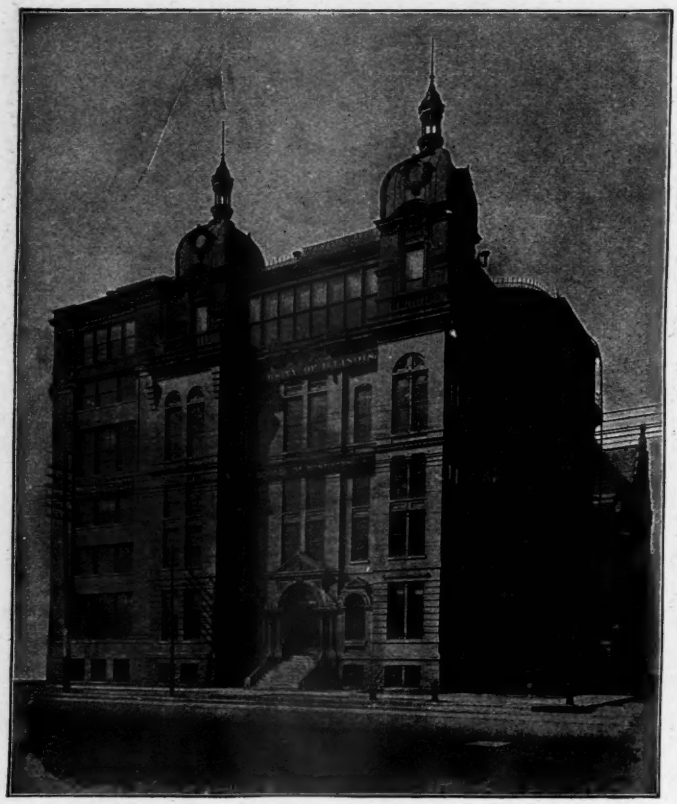

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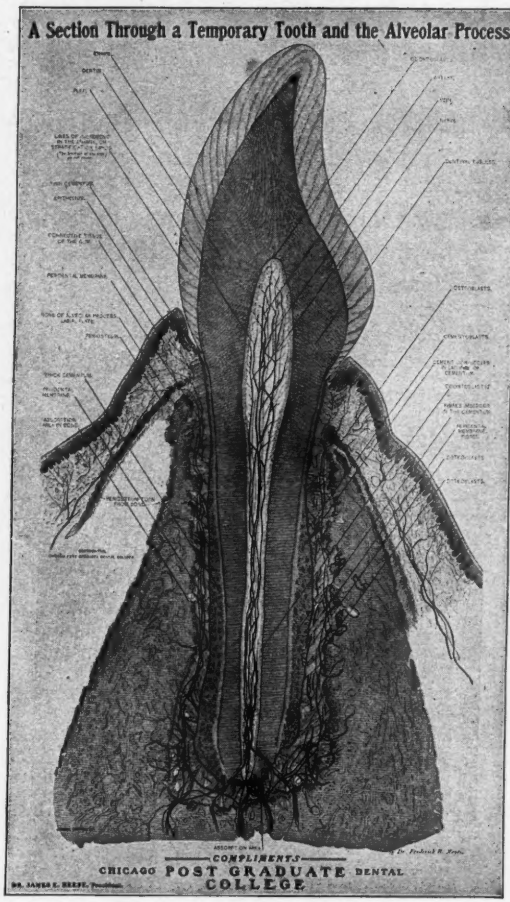

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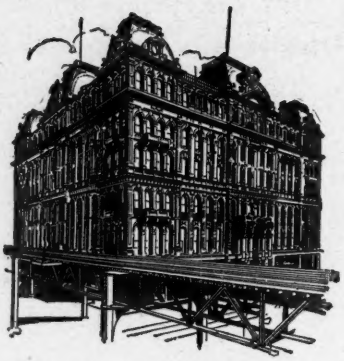

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